Streamflow measurement in Boynton Slough during a storm event

Truckee Meadows Stormwater Monitoring Annual Report
Fiscal Year 2019

Prepared for: CITY OF RENO

In Cooperation with:

City of Sparks

Nevada DOT Safe and Connected

Washoe County, Nevada 1861

Western Regional Water Commission

October 2019

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The Truckee Meadows Stormwater Permit Coordinating Committee

(NPDES MS4 Discharge Permit No. NV000001)

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EXECUTIVE SUMMARY

The Truckee River flows through the Truckee Meadows and water quality is of particular concern because the river has a number of beneficial uses including aquatic habitat, recreation, and potable water. To attain nutrient-related water quality objectives in the Truckee River, the NDEP has developed a Total Maximum Daily Load (TMDL) for nitrogen, phosphorus, and TDS.

In 1990, the Nevada Division of Environmental Protection (NDEP) issued a Municipal Separate Storm Sewer System (MS4) permit to the Truckee Meadows Region, which includes the City of Reno, City of Sparks, and Washoe County. The permit requires the continued administration, implementation, and enforcement of a Stormwater Management Program (SWMP) to mitigate pollution from stormwater runoff within the Truckee Meadows permit area including receiving waters of the Truckee River and its tributaries.

Storm event and baseflow (ambient) water quality samples have been collected since 2003 as part of the SWMP to better characterize stormwater quality. This annual report is required under the MS4 permit to: (a) report stormwater quality measured in fiscal year 2019 (FY2019); (b) continue developing a robust data set of stormwater quality to facilitate identification of water quality or environmental degradation problems in the Truckee Meadows; (c) document changes in water quality over time in response to land management, sediment control strategies, and other improvement measures; and (d) promote continued protection of the Truckee River.

Balance Hydrologics, Inc. evaluated water quality in storm events and baseflow at 15 monitoring stations as part of the Truckee Meadows Regional Storm Water Quality Management Program in FY2019. Grab samples were collected, and instantaneous loads were quantified for 7 stations, while 8 automated samplers were used at 4 urban outfalls and 4 tributary stations to calculate constituent loads to the Truckee River during storm event and baseflow conditions. Decreases in water quality are expected in high runoff events and the purpose of this project is to get an annual snapshot of at least two storms that meet the qualifications for sampling as set out in the 2018 SAP and fulfill requirements of the MS4 permit.

Total annual precipitation in the Truckee Meadows in FY2019, as measured at the Reno-Tahoe International Airport (RTIA), was 12.07 inches and well above the long-term annual average of 7.40 inches. Most of this precipitation fell in January and February and late winter/early spring storms in March. There were some summer convective storms observed in July, September 2018. April, May and June 2019 were mostly dry.

Balance staff collected 2 storm event samples at each station during 4 different storm events, one early fall cut-off low storm (a small storm from part of another frontal system that did not directly affect the region) and three winter frontal storms. Baseflow water quality samples were also collected by Balance staff at 11 tributary monitoring stations during summer baseflow (September 4-7, 2018) and winter baseflow (March 18-19, 2019).

Most Total-N concentrations in storm events exceeded water quality standards (WQS) at all locations where WQS are established. Many Total-N concentrations in tributary baseflow also exceeded WQS across all locations sampled where WQS are established, except winter baseflow at Alum Creek. The highest storm event Total-N concentrations were measured at urban outfalls. The highest baseflow Total-N concentrations were measured at North Truckee Drain and Yori Drain.

Total-P concentrations in storm events ranged between 0.07 mg/L and 4.7 mg/L. In both storm events sampled in FY2019, Total-P concentrations exceeded the Whites Creek WQS while baseflow values did not exceed the WQS (Whites Creek has the only single value WQS for Total-P in the Truckee Meadows). The highest storm event Total-P concentrations were measured at urban outfalls and the North Truckee Drain. The highest baseflow Total-P concentrations were measured at Steamboat Creek and Chalk Creek.

TDS concentrations in storm events were also measured and compared across all stations. TDS WQS were exceeded at least once at all 4 urban outfall stations, and all Chalk Creek samples were in exceedance of WQS. Steamboat Creek WQS was met at the Steamboat Creek at Rhodes Road station; other Steamboat Creek sites do not have established WQS. The highest storm event TDS concentrations were measured at Chalk Creek and the Arlington urban outfall. The highest baseflow TDS concentrations were also measured at Chalk Creek, as well as at North Truckee Drain. Overall, TDS results showed the lowest incidence of WQS exceedance amongst sampled constituents.

Limited samples were collected or analyzed for *E. coli* in FY2019 due to holding time constraints at the time of sampling. Samples were limited to Whites Creek, Steamboat Creek at Rhodes Road and 3 of the 4 urban outfalls. Counts exceeded WQS for both Whites Creek and Steamboat Creek at Rhodes Road for the January 2019 storm sample and the summer 2018 baseflow sample.

Physical parameters were measured manually upon every station visit when water was present, including pH, specific conductance, DO, and turbidity. All measures of DO met WQS where established. Most measures of pH met established WQS to protect beneficial uses with a few exceptions; Yori Drain exceeded WQS for pH in July and August. There are no WQS established for specific conductance or turbidity, but there are criteria for beneficial use (NAC 445a. 1684, 1686 and 1688) regarding turbidity. Most samples collected in FY2019 exceeded turbidity criteria, but this would be expected in high runoff events and does not reflect annual averages.

Storm event nutrient loads were calculated during 2 storms at every station. Tributaries draining large areas typically have the highest loads, but areas with more urban land-uses typically are responsible for higher pollutant production rates or yields. Also, in the past, frontal storms have generated higher loads than convective storms (thunderstorms). These results may be reflective of the amount of total runoff that frontal storms typically produce, as opposed to scattered precipitation from summer and fall convective storms. In FY2019, the January 16-17 frontal storm event generated the highest pollutant loads and yields, likely due to the highest amount of precipitation from the sampled storms in FY2019.

Summer baseflow daily loads in Steamboat Creek were well below TMDLs established for three constituents (Total-N, Total-P, and TDS) in the Truckee River at Lockwood. Conversely, Total-N and Total-P winter baseflow daily loads exceeded the TMDLs in the Truckee River, with the majority of the load being delivered from Steamboat Creek.

1 INTRODUCTION AND PROJECT PURPOSE

1.1 Introduction

The Truckee Meadows Storm Water Permit Coordinating Committee (SWPCC) is composed of representatives of the City of Reno, City of Sparks and Washoe County and is responsible for the development, administration, and implementation of the Stormwater Management Program (SWMP) for the Truckee Meadows (**Figure 1-1**). This is part of a National Pollution Discharge Elimination System (NPDES) Permit to monitor and implement source controls to reduce and prevent harmful pollutants from being washed by stormwater runoff into local water bodies. The SWPCC is required to conduct a stormwater monitoring program following a Sampling and Analysis Plan (SAP) that describes the sampling program and approach. Under the SWMP, sampling has been conducted since 2003 at a number of established monitoring stations across the Truckee Meadows with results reported to the Nevada Department of Environmental Protection (NDEP). In fiscal year[1] 2019 (FY2019), Balance Hydrologics (Balance) was contracted to continue implementing the stormwater monitoring program under the guidance of the SWPCC and in accordance with the 2018 SAP (Trustman and others, 2018).

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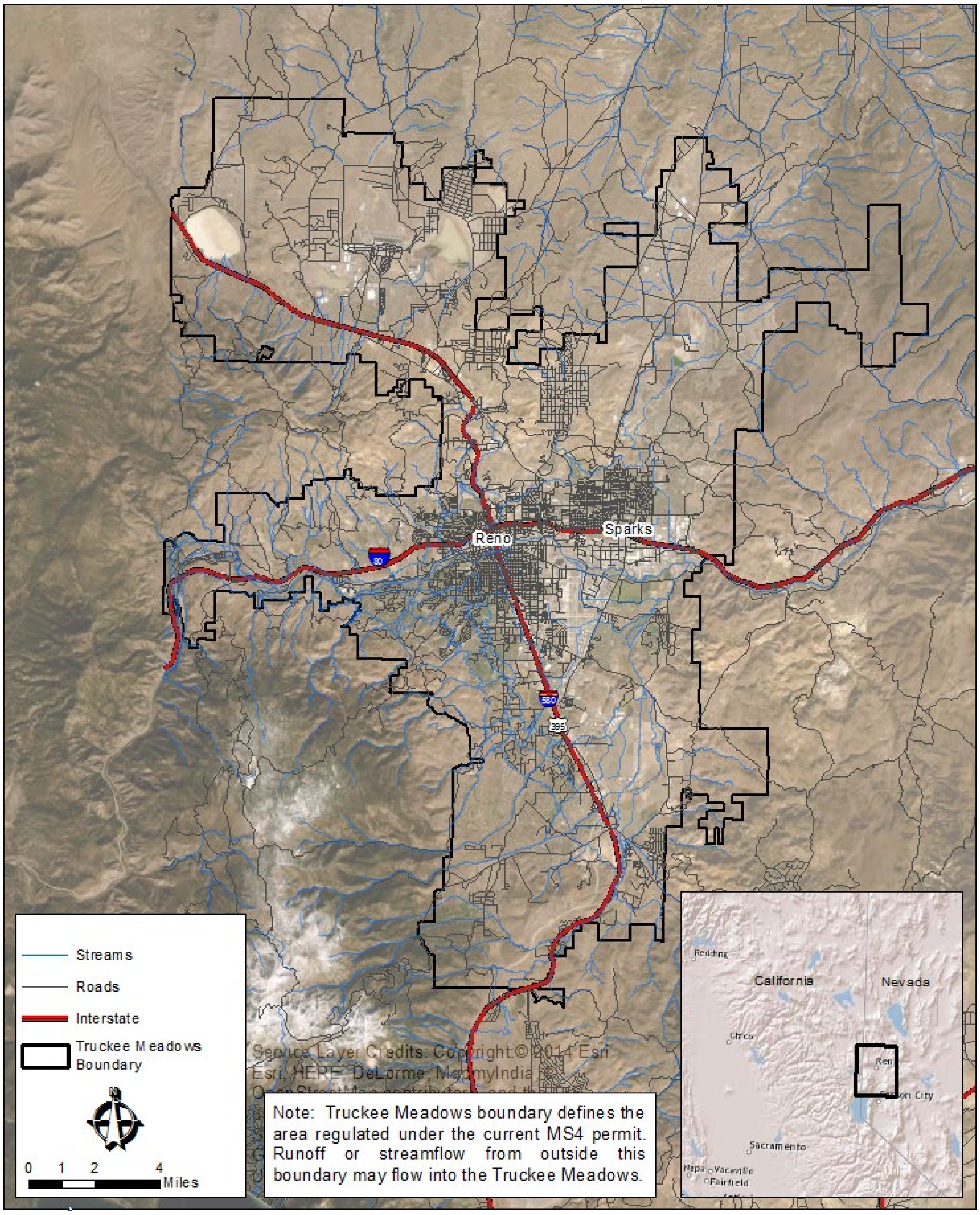
[1] Fiscal year corresponds to the City of Reno's 12-month fiscal period beginning July 1, for a given year through June 30 of the following named year.

1.2 Project Purpose

The primary goal of the stormwater monitoring program is to develop a better understanding of how stormwater runoff affects receiving waters within the MS4 permit area over time through monitoring, research and investigation (Stantec, 2012). With accurate, and representative monitoring data, program effectiveness can be assessed and new or revised stormwater Best Management Practices (BMPs) can be identified. In support of this overall program goal, four monitoring objectives have been identified:

1. Characterize storm event water quality in tributaries and urban stormwater outfalls to the Truckee River;
2. Collect the data necessary to improve our understanding of stormwater effects on listed constituents in impaired receiving waters;
3. Measure the baseflow water quality in selected tributaries with varying land-use types within the study area; and
4. Conduct special studies and investigations as needs arise and funding is available to better understand stormwater issues in the area.



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Note: Truckee Meadows boundary defines the area regulated under the current MS4 permit. Runoff or streamflow from outside this boundary may flow into the Truckee Meadows.

Figure 1-1 Location Map of Truckee Meadows, including City of Reno, City of Sparks and parts of Washoe County, Nevada

1.3 Regulatory Background

The discharge of municipal stormwater runoff within the Truckee Meadows is regulated under a single discharge permit, a Municipal Separate Storm Sewer System (MS4) permit. The permit is jointly issued to the City of Reno, City of Sparks, and Washoe County and allows the co-permittees to discharge municipal stormwater runoff into the receiving waters of the Truckee River and tributaries. The permit also requires stormwater monitoring, defined as regular observation and sampling that is representative of the volume and nature of the monitored discharge (NDEP, 2010).

In addition to the NPDES Stormwater Permit Program, Section 303(d) of the Clean Water Act also established a program to manage water pollution in water bodies that are not meeting federal water quality standards. Section 303(d) requires that states establish a list of impaired water bodies and assess the sources of that pollution.

Every two years, NDEP is required to prepare and submit an updated 303(d) list to the U.S. Environmental Protection Agency (USEPA). The most recent list (NDEP, 2016) identifies the Truckee River, 10 tributaries, and 3 other water bodies (i.e., lakes) within the Truckee Meadows as impaired (**Table 1-1**). At the time of issuing this report, NDEP has not released an updated 303 (d) list. Impairment differs between listed water bodies, but cited constituents of concern include nutrients, bacteria, metals, and general physical parameters such as pH, dissolved oxygen, specific conductance, and temperature.

Table 1-1 2016 Impaired Waters and Listed Constituents 303(d) List, Truckee Meadows, Nevada (adapted from NDEP, 2016)

Monitoring	Water Name	Reach Impaired	Impairment	Impaired Beneficial Use
FY2019	Truckee River	From NV-CA state line to E. McCarran	Water Temperature	AQL
Yes	Alum Creek	Entire reach	pH Total-P Ortho-P Water Temperature TDS TSS	PWL, RWC AQL, RWC AQL, RWC AQL MDS AQL
Yes	Chalk Creek	Entire reach	Nitrate Total-P Ortho-P Selenium Sulfates Temperature TDS TSS	AQL, RWC AQL, RWC AQL, RWC AQL MDS AQL MDS AQL
No	Sparks Marina	Entire reservoir	Total-N Total-P TDS	AQL, RWC AQL, RWC MDS
No	Tracy Pond	Entire area	pH	AQL, PWL, RWC
No	Dry Creek	Headwaters to Boynton Slough	E-coli	RWC
No	Evans Creek	HWY 395 to Dry Creek	E-coli	RWC
No	Franktown Creek	From irrigation diversion to Washoe Lake	Iron	AQL
No	Galena Creek	(see NDEP, 2014)	pH	AQL, PWL, RWC
No	Hunter Creek	From Hunter Lake to its confluence with the Truckee River	pH	AQL
Yes	Steamboat Creek	Little Washoe Lake to USGS 10349300 USGS 10349300 to Truckee River	E-coli Arsenic Boron E-coli Iron	RWC AQL, IRR, WLS IRR, WLS RWC AQL
Yes	Thomas Creek	Below Steamboat Ditch	Arsenic Boron	AQL, IRR, WLS IRR, WLS
No	Washoe Lakes	Entire lakes	Mercury in fish tissue	FC
Yes (N. Fork Only)	Whites Creek	Middle Fork	E-coli Iron	RWC AQL
		North and South Forks and Whites Creek	Total-P	AQL, RWC
		North Fork	Total-P E-coli	AQL, RWC RWC

Notes:

Monitoring indicated with "yes" include at least one station of the listed waters monitored by Balance Hydrologics, Inc. as part of this program

AQL = aquatic life, FC = fish consumption, IRR = irrigation, MDS = municipal domestic supply, PWL = propagation of wildlife,
RNC = recreation not involving contact with water, RWC = recreation involving contact with water, WLS = watering of livestock.

Ortho-P = Orthophosphate, Total-N = Total Nitrogen, Total-P = Total Phosphorus, TDS = Total Dissolved Solids, TSS = Total Suspended Solids.

The SWPCC prioritizes listed water bodies for monitoring. Ultimately, the monitoring program is devised to be efficient in administering the program within the annual budget allocated each year. As a result, selected constituents of concern and water bodies are targeted for sampling and analysis while others are reserved for future monitoring as additional funding becomes available. Opportunities to revise monitoring locations, add and remove constituents of concern or monitoring stations are addressed in annual reviews and possible revisions or addendums to the SAP.

Nevada's water quality standards, as contained in the Nevada Administrative Code (NAC) 445A.11704 – 445A.2234, define the water quality goals for a segment or length of a stream or river by designating beneficial uses of the water and setting criteria necessary to protect the beneficial uses and/or maintain high water quality. Beneficial uses include, but are not limited to, irrigation, recreation, aquatic life, and drinking water supply. In many cases, listed waters have different beneficial uses and different numeric criteria. Some listed waters have two or more segments with each segment having different beneficial uses and numeric criteria.

For the purposes of this program, specific water-quality numeric criteria were identified for each tributary or segment monitored in accordance with current NAC and their control points. Figure 1-2 shows watershed boundaries for tributaries monitored under this program, stations monitored in FY2019, and tributary or stream segments that have specific beneficial uses and numeric criteria used to compare water quality results measured in this program. Tributary or segment-specific water quality standards are outlined in Table 1-2. Finally, we present water quality parameters, beneficial uses, and water quality standards for each of the six NAC listed streams in tables 1-3 to 1-8. We note that some numeric criteria include single value (S.V.) measures and/or annual averages (A- Avg.). Samples collected as part of this program are considered single value measures and are compared to S.V. standards when they exist. If S.V. standards do not exist for a given parameter, results will be compared to A-Avg., but should be interpreted with caution.

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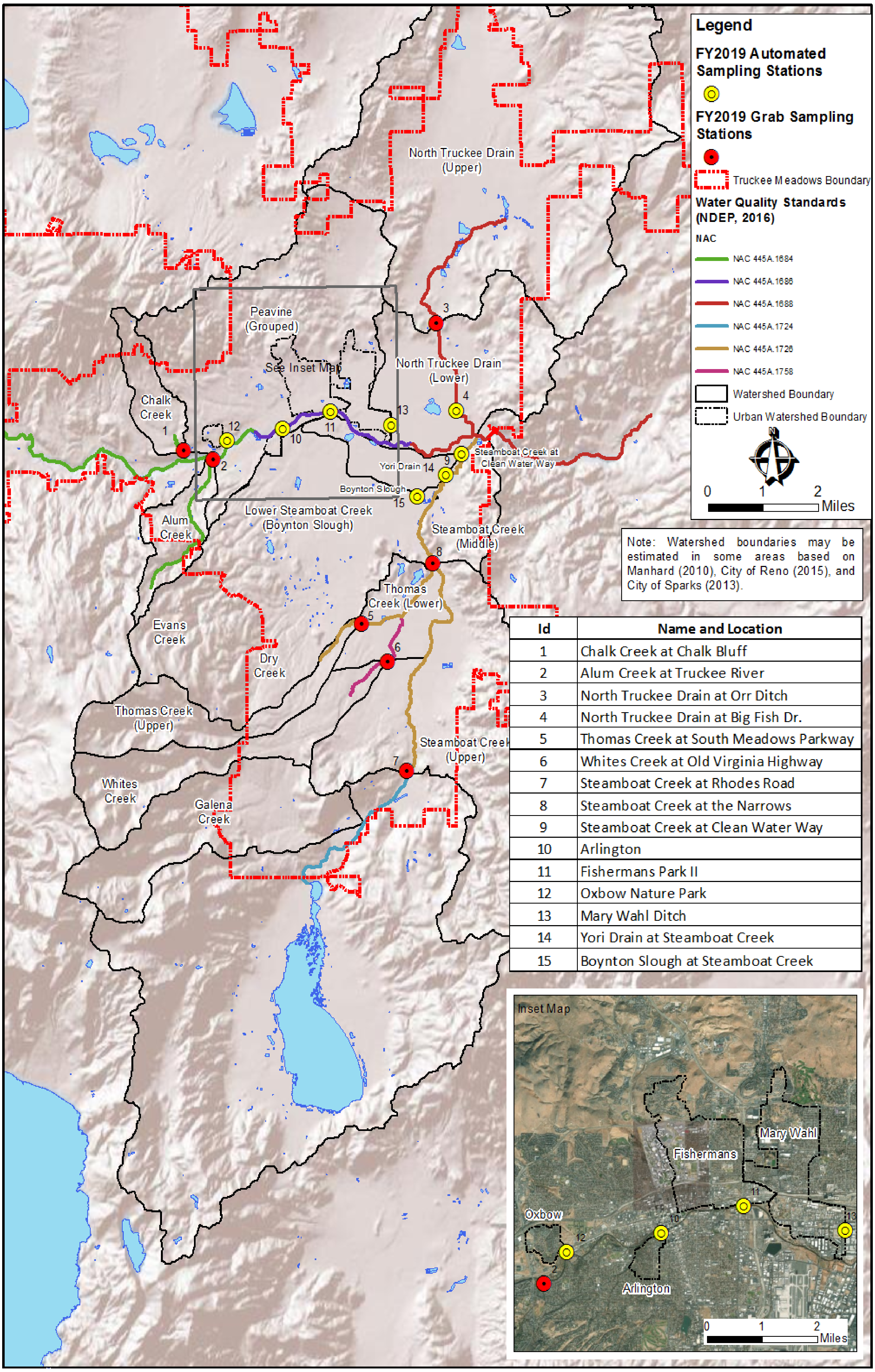


Note: Watershed boundaries may be estimated in some areas based on Manhard (2010), City of Reno (2015), and City of Sparks (2013).

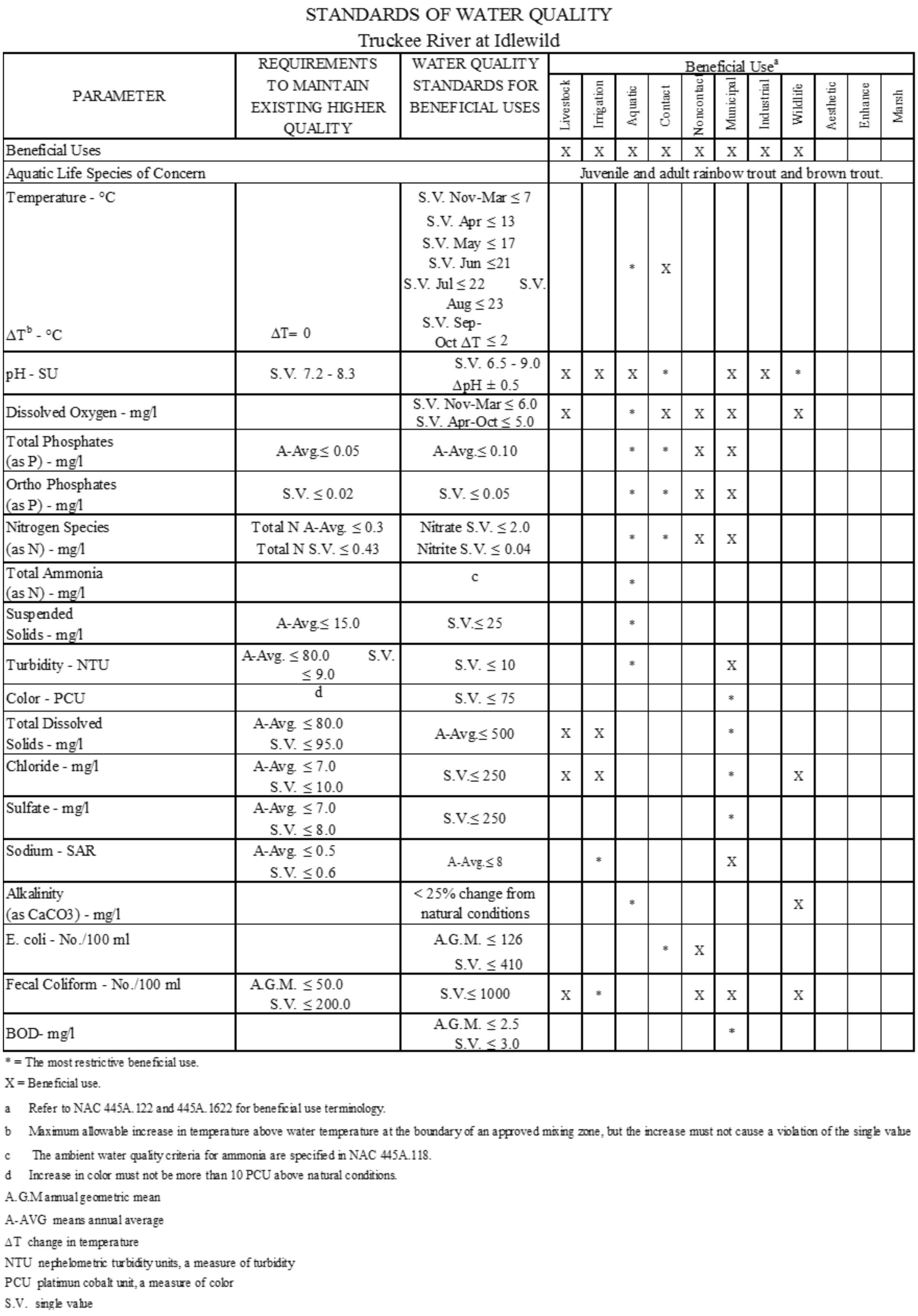
Id	Name and Location
1	Chalk Creek at Chalk Bluff
2	Alum Creek at Truckee River
3	North Truckee Drain at Orr Ditch
4	North Truckee Drain at Big Fish Dr.
5	Thomas Creek at South Meadows Parkway
6	Whites Creek at Old Virginia Highway
7	Steamboat Creek at Rhodes Road
8	Steamboat Creek at the Narrows
9	Steamboat Creek at Clean Water Way
10	Arlington
11	Fishermans Park II
12	Oxbow Nature Park
13	Mary Wahl Ditch
14	Yori Drain at Steamboat Creek
15	Boynton Slough at Steamboat Creek

Figure 1-2 Truckee Meadows Monitoring Map with Sampling Locations Watersheds and 303 (d) Listed Stream Segment and Water Quality Standards

Table 1-2 FY2019 Monitoring Stations with Tributary or Stream Segments Water Quality Standards, per Nevada Administrative Code

Nevada Administrative Code	Description of Water Quality Control	Monitored Waters That Apply	Monitoring Station	Monitoring Station Code
NAC 445a. 1684	*Truckee River from California/Nevada State Line to Idlewild*			
		Chalk Creek	Chalk Bluff	CC@CB
		Alum Creek	at Truckee River	AC@TR
		Urban Outfall	Oxbow Nature Park	C-24
NAC 445a. 1686	*Truckee River from Idlewild to E. McCarren Boulevard Bridge*			
		Urban Outfall	Arlington	H-19
		Urban Outfall	Fisherman's Park II	D-16
		Urban Outfall	Mary Wahl Drain	SDOE 008936
NAC 445a. 1688	*Truckee River from E. McCarren Boulevard Bridge to Lockwood*			
		North Truckee Drain	at Orr Ditch	NTD@ORR
		North Truckee Drain	at Big Fish Drive	NTD@BFD
NAC 445a. 1724	*Steamboat Creek at gaging station (Rhodes Road upstream to Washoe Lake)*			
		Steamboat Creek	at Rhodes Road	SBC@RR
NAC 445a. 1726	*Steamboat Creek from USGS gage 10349300 to confluence with Truckee River*			
		Steamboat Creek	at the Narrows	SBC@NAR
		Steamboat Creek	at Clean Water Way	SBC@CWW
		Yori Drain	at Steamboat Creek	YD@SBC
		Boynton Slough	at Steamboat Creek	BS@SBC
		Thomas Creek	at South Meadow Parkway	TC@SMP
NAC 445a. 1758	*Whites Creek below Steamboat Ditch*			
		N.F. Whites Creek	at Old Virginia Highway	WC@OVH

Table 1-3 Standards of Water Quality, Truckee River from California/Nevada State Line to Idlewild (NAC 445a. 1684)



STANDARDS OF WATER QUALITY

Truckee River at Idlewild

PARAMETER	REQUIREMENTS TO MAINTAIN EXISTING HIGHER QUALITY	WATER QUALITY STANDARDS FOR BENEFICIAL USES	Beneficial Use[a]										
			Livestock	Irrigation	Aquatic	Contact	Noncontac	Municipal	Industrial	Wildlife	Aesthetic	Enhance	Marsh
Beneficial Uses			X	X	X	X	X	X	X	X			
Aquatic Life Species of Concern			Juvenile and adult rainbow trout and brown trout.										
Temperature - °C ΔT^b - °C	ΔT= 0	S.V. Nov-Mar ≤ 7 S.V. Apr ≤ 13 S.V. May ≤ 17 S.V. Jun ≤21 S.V. Jul ≤ 22 S.V. Aug ≤ 23 S.V. Sep-Oct ΔT ≤ 2			*	X							
pH - SU	S.V. 7.2 - 8.3	S.V. 6.5 - 9.0 ΔpH ± 0.5	X	X	X	*		X	X	*			
Dissolved Oxygen - mg/l		S.V. Nov-Mar ≤ 6.0 S.V. Apr-Oct ≤ 5.0	X		*	X	X	X		X			
Total Phosphates (as P) - mg/l	A-Avg.≤ 0.05	A-Avg.≤ 0.10			*	*	X	X					
Ortho Phosphates (as P) - mg/l	S.V. ≤ 0.02	S.V. ≤ 0.05			*	*	X	X					
Nitrogen Species (as N) - mg/l	Total N A-Avg. ≤ 0.3 Total N S.V. ≤ 0.43	Nitrate S.V. ≤ 2.0 Nitrite S.V. ≤ 0.04			*	*	X	X					
Total Ammonia (as N) - mg/l		c			*								
Suspended Solids - mg/l	A-Avg.≤ 15.0	S.V.≤ 25			*								
Turbidity - NTU	A-Avg. ≤ 80.0 S.V. ≤ 9.0	S.V. ≤ 10			*			X					
Color - PCU	d	S.V. ≤ 75						*					
Total Dissolved Solids - mg/l	A-Avg. ≤ 80.0 S.V. ≤ 95.0	A-Avg.≤ 500	X	X				*					
Chloride - mg/l	A-Avg. ≤ 7.0 S.V. ≤ 10.0	S.V.≤ 250	X	X				*		X			
Sulfate - mg/l	A-Avg. ≤ 7.0 S.V. ≤ 8.0	S.V.≤ 250						*					
Sodium - SAR	A-Avg. ≤ 0.5 S.V. ≤ 0.6	A-Avg.≤ 8		*				X					
Alkalinity (as CaCO3) - mg/l		< 25% change from natural conditions			*					X			
E. coli - No./100 ml		A.G.M. ≤ 126 S.V. ≤ 410				*	X						
Fecal Coliform - No./100 ml	A.G.M. ≤ 50.0 S.V. ≤ 200.0	S.V.≤ 1000	X	*			X	X		X			
BOD- mg/l		A.G.M. ≤ 2.5 S.V. ≤ 3.0						*					

* = The most restrictive beneficial use.

X = Beneficial use.

a Refer to NAC 445A.122 and 445A.1622 for beneficial use terminology.

b Maximum allowable increase in temperature above water temperature at the boundary of an approved mixing zone, but the increase must not cause a violation of the single value

c The ambient water quality criteria for ammonia are specified in NAC 445A.118.

d Increase in color must not be more than 10 PCU above natural conditions.

A.G.M annual geometric mean

A-AVG means annual average

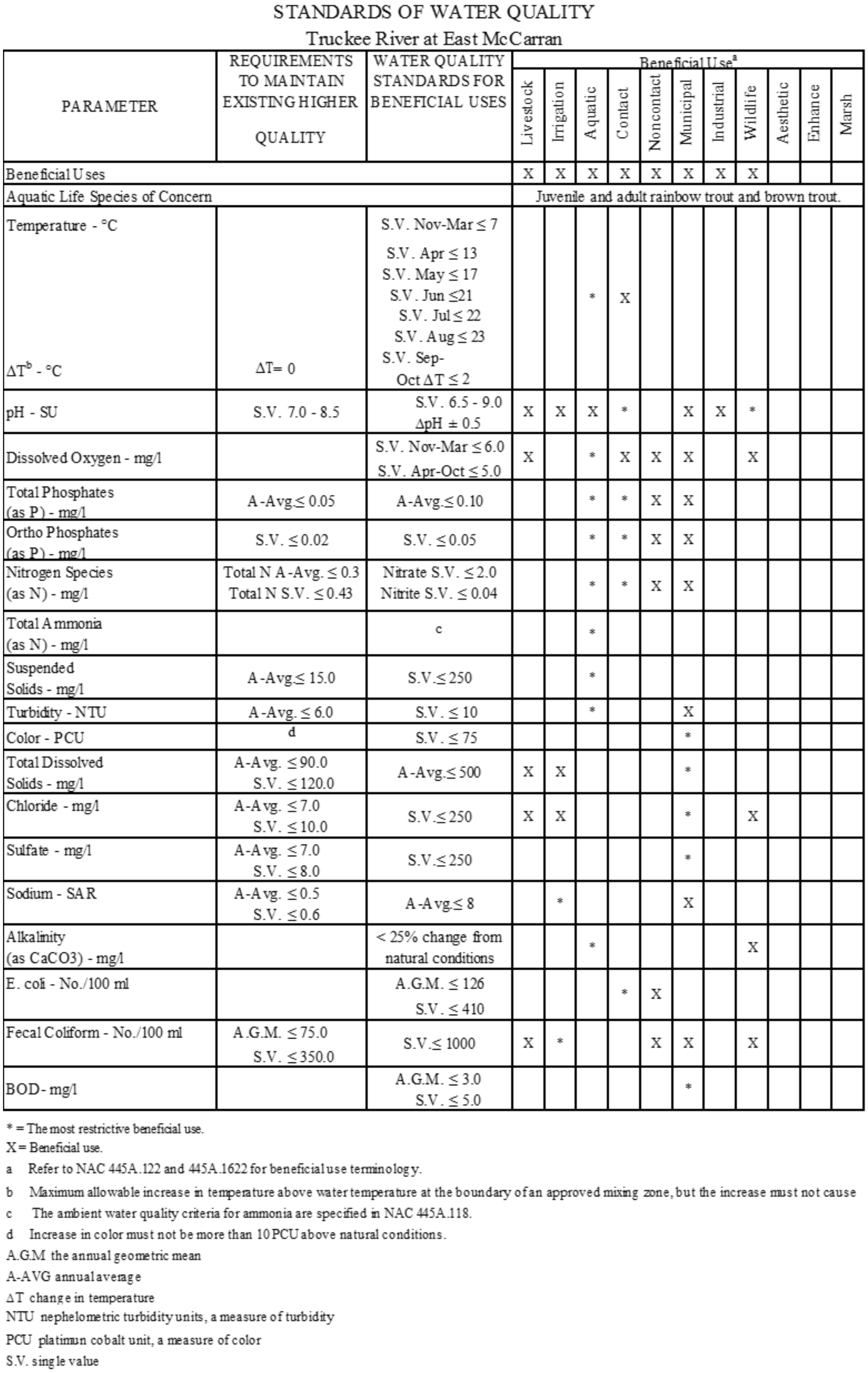
ΔT change in temperature

NTU nephelometric turbidity units, a measure of turbidity

PCU platimun cobalt unit, a measure of color

S.V. single value

Table 1-4 Standards of Water Quality, Truckee River from Idlewild to E. McCarren Boulevard Bridge (NAC 445a. 1686)



STANDARDS OF WATER QUALITY

Truckee River at East McCarran

PARAMETER	REQUIREMENTS TO MAINTAIN EXISTING HIGHER QUALITY	WATER QUALITY STANDARDS FOR BENEFICIAL USES	Beneficial Use[a]										
			Livestock	Irrigation	Aquatic	Contact	Noncontact	Municipal	Industrial	Wildlife	Aesthetic	Enhance	Marsh
Beneficial Uses			X	X	X	X	X	X	X	X			
Aquatic Life Species of Concern			Juvenile and adult rainbow trout and brown trout.										
Temperature - °C ΔT[b] - °C	ΔT= 0	S.V. Nov-Mar ≤ 7 S.V. Apr ≤ 13 S.V. May ≤ 17 S.V. Jun ≤21 S.V. Jul ≤ 22 S.V. Aug ≤ 23 S.V. Sep-Oct ΔT ≤ 2			*	X							
pH - SU	S.V. 7.0 - 8.5	S.V. 6.5 - 9.0 ΔpH ± 0.5	X	X	X	*		X	X	*			
Dissolved Oxygen - mg/l		S.V. Nov-Mar ≤ 6.0 S.V. Apr-Oct ≤ 5.0	X		*	X	X	X		X			
Total Phosphates (as P) - mg/l	A-Avg.≤ 0.05	A-Avg.≤ 0.10			*	*	X	X					
Ortho Phosphates (as P) - mg/l	S.V. ≤ 0.02	S.V. ≤ 0.05			*	*	X	X					
Nitrogen Species (as N) - mg/l	Total N A-Avg. ≤ 0.3 Total N S.V. ≤ 0.43	Nitrate S.V. ≤ 2.0 Nitrite S.V. ≤ 0.04			*	*	X	X					
Total Ammonia (as N) - mg/l		c			*								
Suspended Solids - mg/l	A-Avg.≤ 15.0	S.V.≤ 250			*								
Turbidity - NTU	A-Avg. ≤ 6.0	S.V. ≤ 10			*			X					
Color - PCU	d	S.V. ≤ 75						*					
Total Dissolved Solids - mg/l	A-Avg. ≤ 90.0 S.V. ≤ 120.0	A-Avg.≤ 500	X	X				*					
Chloride - mg/l	A-Avg. ≤ 7.0 S.V. ≤ 10.0	S.V.≤ 250	X	X				*		X			
Sulfate - mg/l	A-Avg. ≤ 7.0 S.V. ≤ 8.0	S.V.≤ 250						*					
Sodium - SAR	A-Avg. ≤ 0.5 S.V. ≤ 0.6	A-Avg.≤ 8		*				X					
Alkalinity (as CaCO3) - mg/l		< 25% change from natural conditions			*					X			
E. coli - No./100 ml		A.G.M. ≤ 126 S.V. ≤ 410				*	X						
Fecal Coliform - No./100 ml	A.G.M. ≤ 75.0 S.V. ≤ 350.0	S.V.≤ 1000	X	*			X	X		X			
BOD- mg/l		A.G.M. ≤ 3.0 S.V. ≤ 5.0						*					

* = The most restrictive beneficial use.

X = Beneficial use.

a Refer to NAC 445A.122 and 445A.1622 for beneficial use terminology.

b Maximum allowable increase in temperature above water temperature at the boundary of an approved mixing zone, but the increase must not cause

c The ambient water quality criteria for ammonia are specified in NAC 445A.118.

d Increase in color must not be more than 10 PCU above natural conditions.

A.G.M the annual geometric mean

A-AVG annual average

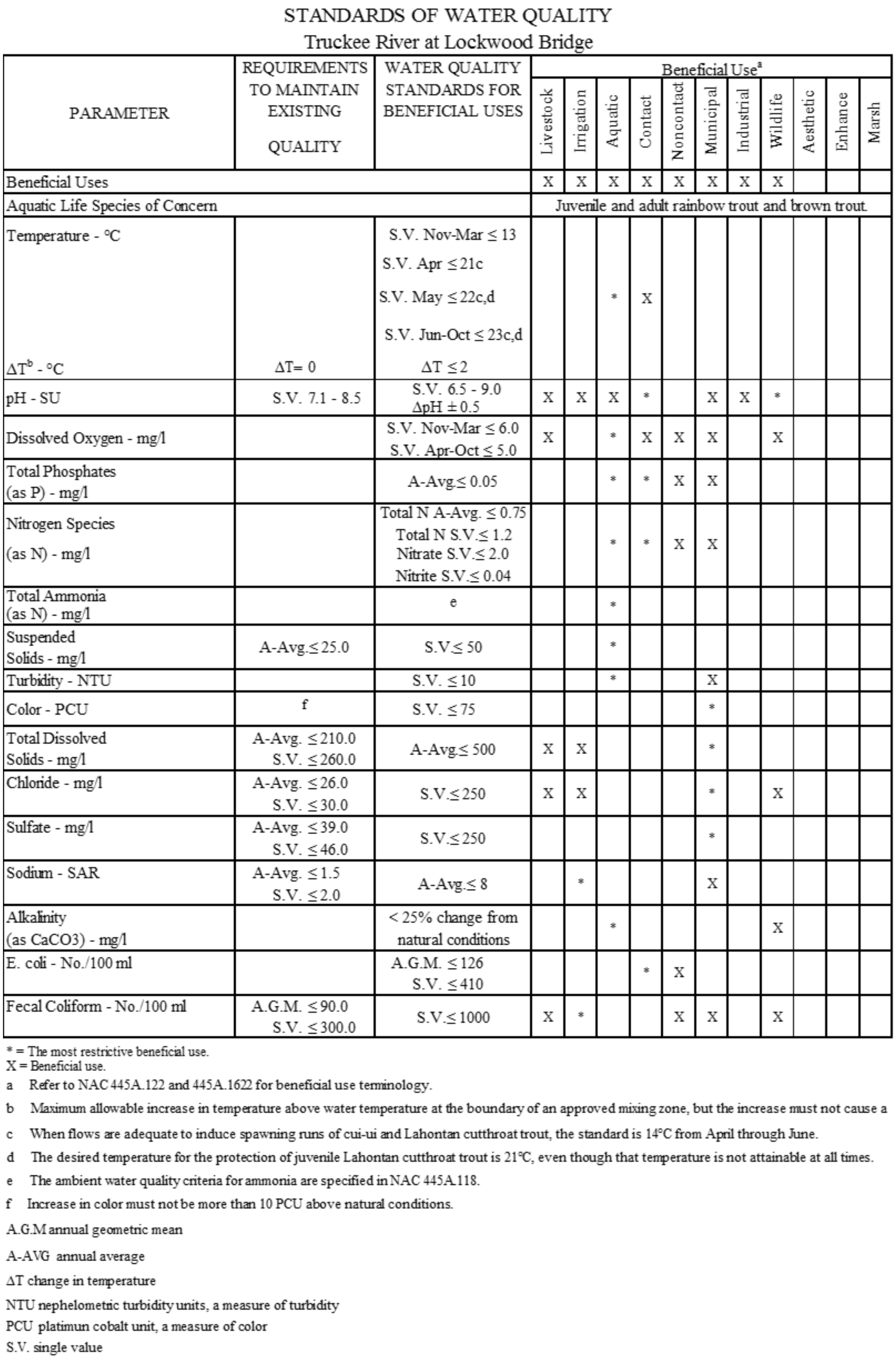
ΔT change in temperature

NTU nephelometric turbidity units, a measure of turbidity

PCU platinum cobalt unit, a measure of color

S.V. single value

Table 1-5 Standards of Water Quality, Truckee River from E. McCarren Boulevard Bridge to Lockwood (NAC 445a. 1688)



STANDARDS OF WATER QUALITY
Truckee River at Lockwood Bridge

PARAMETER	REQUIREMENTS TO MAINTAIN EXISTING QUALITY	WATER QUALITY STANDARDS FOR BENEFICIAL USES	Beneficial Use[a]										
			Livestock	Irrigation	Aquatic	Contact	Noncontact	Municipal	Industrial	Wildlife	Aesthetic	Enhance	Marsh
Beneficial Uses			X	X	X	X	X	X	X	X			
Aquatic Life Species of Concern			Juvenile and adult rainbow trout and brown trout.										
Temperature - °C ΔT^b - °C	ΔT= 0	S.V. Nov-Mar ≤ 13 S.V. Apr ≤ 21c S.V. May ≤ 22c,d S.V. Jun-Oct ≤ 23c,d ΔT ≤ 2			*	X							
pH - SU	S.V. 7.1 - 8.5	S.V. 6.5 - 9.0 ΔpH ± 0.5	X	X	X	*		X	X	*			
Dissolved Oxygen - mg/l		S.V. Nov-Mar ≤ 6.0 S.V. Apr-Oct ≤ 5.0	X		*	X	X	X		X			
Total Phosphates (as P) - mg/l		A-Avg.≤ 0.05			*	*	X	X					
Nitrogen Species (as N) - mg/l		Total N A-Avg. ≤ 0.75 Total N S.V.≤ 1.2 Nitrate S.V.≤ 2.0 Nitrite S.V.≤ 0.04			*	*	X	X					
Total Ammonia (as N) - mg/l		e			*								
Suspended Solids - mg/l	A-Avg.≤ 25.0	S.V.≤ 50			*								
Turbidity - NTU		S.V. ≤ 10			*			X					
Color - PCU	f	S.V. ≤ 75						*					
Total Dissolved Solids - mg/l	A-Avg. ≤ 210.0 S.V. ≤ 260.0	A-Avg.≤ 500	X	X				*					
Chloride - mg/l	A-Avg. ≤ 26.0 S.V. ≤ 30.0	S.V.≤ 250	X	X				*		X			
Sulfate - mg/l	A-Avg. ≤ 39.0 S.V. ≤ 46.0	S.V.≤ 250						*					
Sodium - SAR	A-Avg. ≤ 1.5 S.V. ≤ 2.0	A-Avg.≤ 8		*				X					
Alkalinity (as CaCO3) - mg/l		< 25% change from natural conditions			*					X			
E. coli - No./100 ml		A.G.M. ≤ 126 S.V. ≤ 410				*	X						
Fecal Coliform - No./100 ml	A.G.M. ≤ 90.0 S.V. ≤ 300.0	S.V.≤ 1000	X	*			X	X		X			

* = The most restrictive beneficial use.
X = Beneficial use.

a Refer to NAC 445A.122 and 445A.1622 for beneficial use terminology.

b Maximum allowable increase in temperature above water temperature at the boundary of an approved mixing zone, but the increase must not cause a

c When flows are adequate to induce spawning runs of cui-ui and Lahontan cutthroat trout, the standard is 14°C from April through June.

d The desired temperature for the protection of juvenile Lahontan cutthroat trout is 21°C, even though that temperature is not attainable at all times.

e The ambient water quality criteria for ammonia are specified in NAC 445A.118.

f Increase in color must not be more than 10 PCU above natural conditions.

A.G.M annual geometric mean

A-AVG annual average

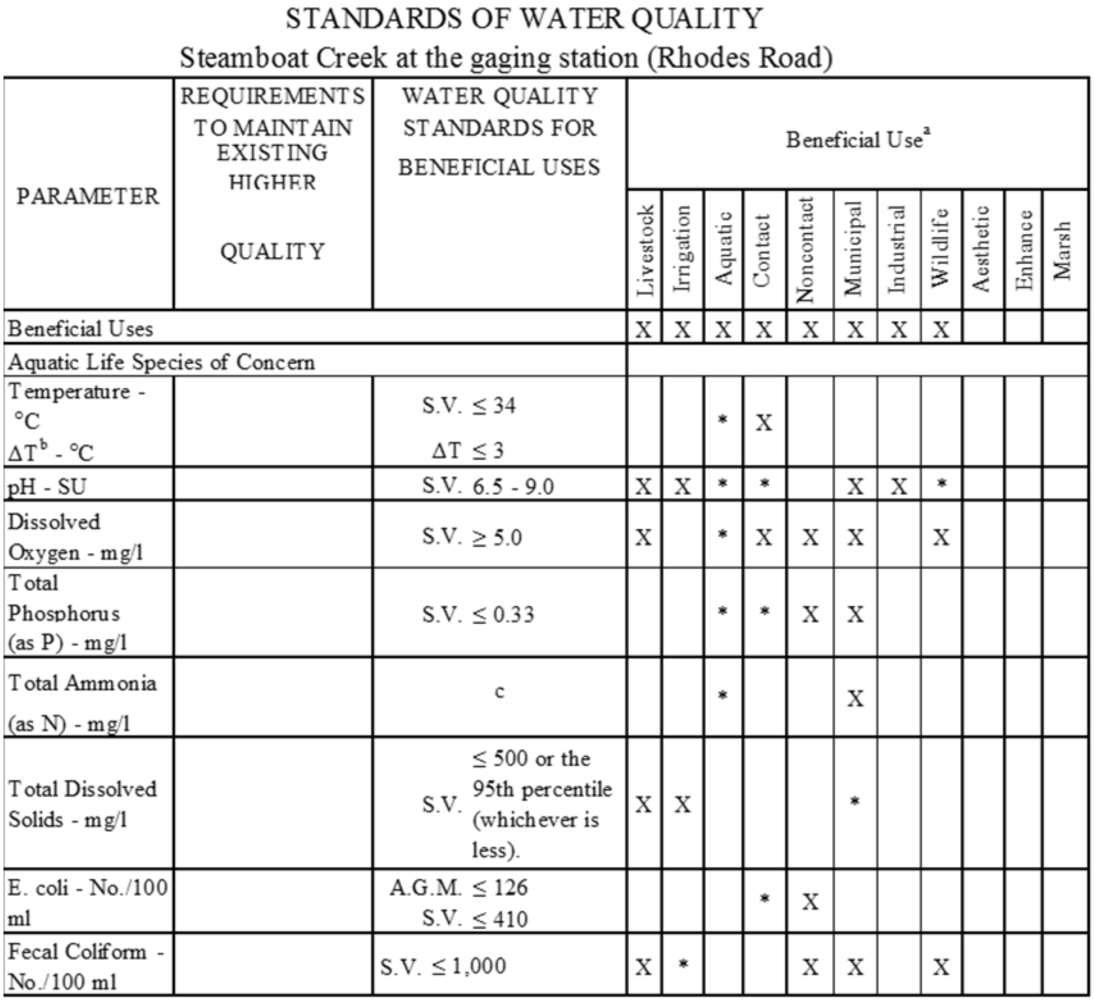
ΔT change in temperature

NTU nephelometric turbidity units, a measure of turbidity

PCU platimun cobalt unit, a measure of color

S.V. single value

Table 1-6 Standards of Water Quality, Steamboat Creek at Gaging Station (NAC 445a. 1724)

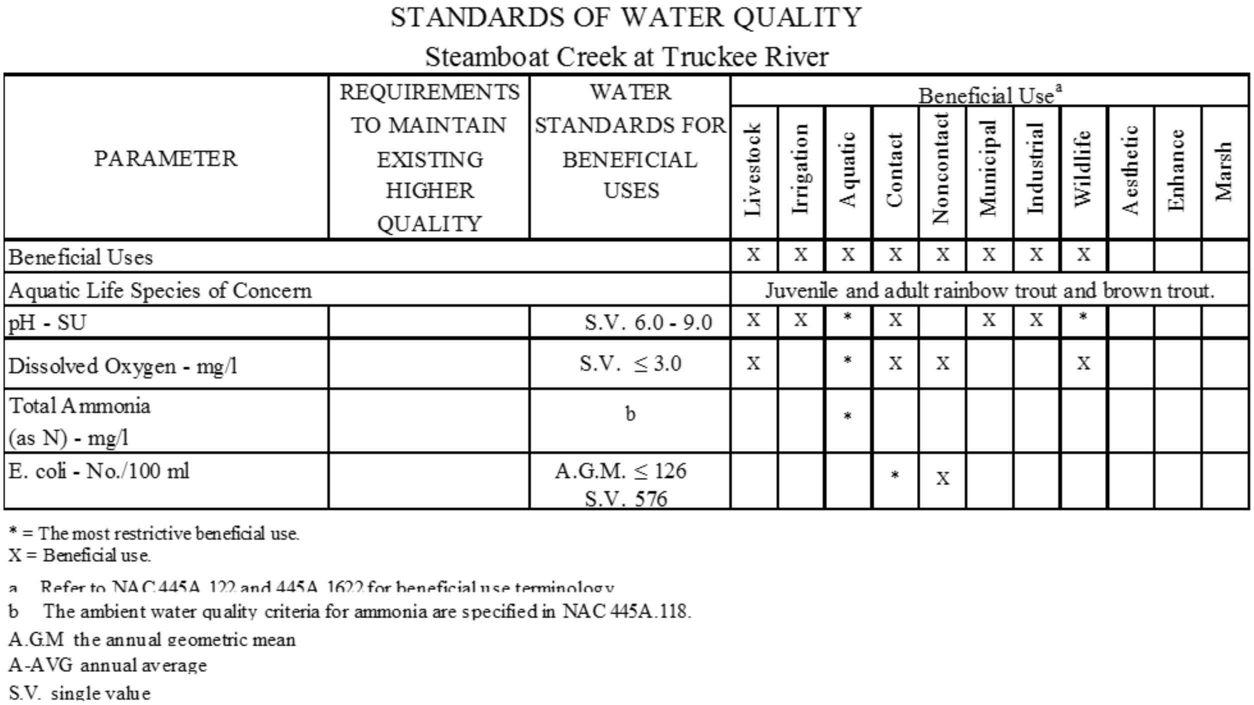


STANDARDS OF WATER QUALITY

Steamboat Creek at the gaging station (Rhodes Road)

PARAMETER	REQUIREMENTS TO MAINTAIN EXISTING HIGHER QUALITY	WATER QUALITY STANDARDS FOR BENEFICIAL USES	Beneficial Use[a]										
			Livestock	Irrigation	Aquatic	Contact	Noncontact	Municipal	Industrial	Wildlife	Aesthetic	Enhance	Marsh
Beneficial Uses			X	X	X	X	X	X	X	X			
Aquatic Life Species of Concern													
Temperature - °C ΔT^b - °C		S.V. ≤ 34 ΔT ≤ 3			*	X							
pH - SU		S.V. 6.5 - 9.0	X	X	*	*		X	X	*			
Dissolved Oxygen - mg/l		S.V. ≥ 5.0	X		*	X	X	X		X			
Total Phosphorus (as P) - mg/l		S.V. ≤ 0.33			*	*	X	X					
Total Ammonia (as N) - mg/l		c			*			X					
Total Dissolved Solids - mg/l		S.V. ≤ 500 or the 95th percentile (whichever is less).	X	X				*					
E. coli - No./100 ml		A.G.M. ≤ 126 S.V. ≤ 410				*	X						
Fecal Coliform - No./100 ml		S.V. ≤ 1,000	X	*			X	X		X			

Table 1-7 Standards of Water Quality, Steamboat Creek from USGS Gaging Station 10349300 to Confluence with Truckee River (NAC 445a. 1726)



STANDARDS OF WATER QUALITY

Steamboat Creek at Truckee River

PARAMETER	REQUIREMENTS TO MAINTAIN EXISTING HIGHER QUALITY	WATER STANDARDS FOR BENEFICIAL USES	Beneficial Use[a]										
			Livestock	Irrigation	Aquatic	Contact	Noncontact	Municipal	Industrial	Wildlife	Aesthetic	Enhance	Marsh
Beneficial Uses			X	X	X	X	X	X	X	X			
Aquatic Life Species of Concern			Juvenile and adult rainbow trout and brown trout.										
pH - SU		S.V. 6.0 - 9.0	X	X	*	X		X	X	*			
Dissolved Oxygen - mg/l		S.V. ≤ 3.0	X		*	X	X			X			
Total Ammonia (as N) - mg/l		b			*								
E. coli - No./100 ml		A.G.M. ≤ 126 S.V. 576				*	X						

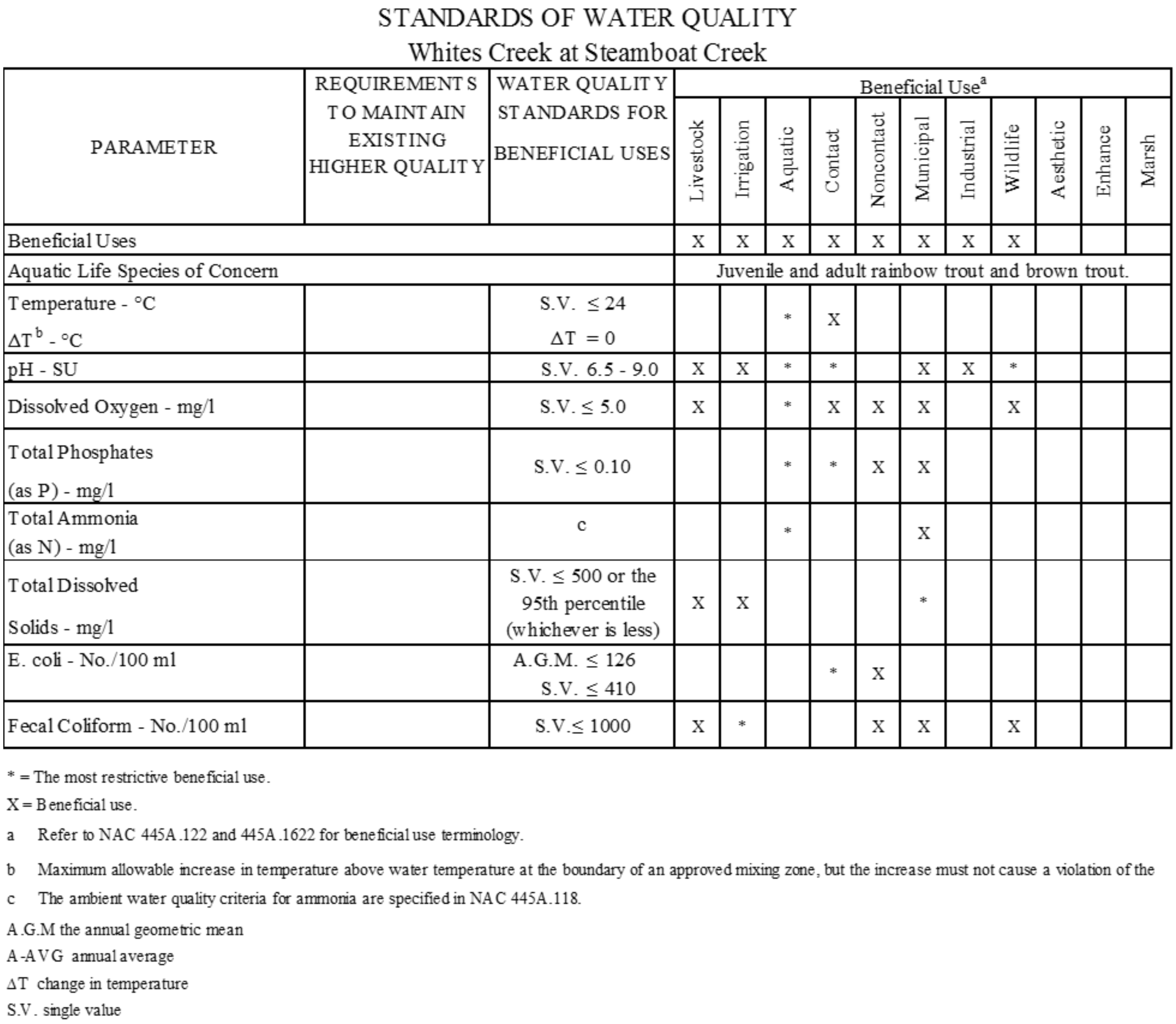
* = The most restrictive beneficial use.
X = Beneficial use.

a Refer to NAC 445A.122 and 445A.1622 for beneficial use terminology

b The ambient water quality criteria for ammonia are specified in NAC 445A.118.

A.G.M the annual geometric mean
A-AVG annual average
S.V. single value

Table 1-8 Standards of Water Quality, Whites Creek below Steamboat Ditch (NAC 445a. 1758)



STANDARDS OF WATER QUALITY
Whites Creek at Steamboat Creek

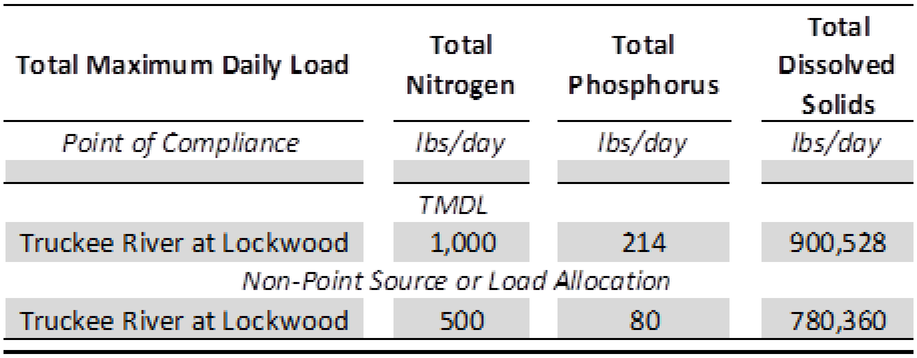
PARAMETER	REQUIREMENTS TO MAINTAIN EXISTING HIGHER QUALITY	WATER QUALITY STANDARDS FOR BENEFICIAL USES	Beneficial Use^a										
			Livestock	Irrigation	Aquatic	Contact	Noncontact	Municipal	Industrial	Wildlife	Aesthetic	Enhance	Marsh
Beneficial Uses			X	X	X	X	X	X	X	X			
Aquatic Life Species of Concern			Juvenile and adult rainbow trout and brown trout.										
Temperature - °C ΔT^b - °C		S.V. ≤ 24 ΔT = 0			*	X							
pH - SU		S.V. 6.5 - 9.0	X	X	*	*		X	X	*			
Dissolved Oxygen - mg/l		S.V. ≤ 5.0	X		*	X	X	X		X			
Total Phosphates (as P) - mg/l		S.V. ≤ 0.10			*	*	X	X					
Total Ammonia (as N) - mg/l		c			*			X					
Total Dissolved Solids - mg/l		S.V. ≤ 500 or the 95th percentile (whichever is less)	X	X				*					
E. coli - No./100 ml		A.G.M. ≤ 126 S.V. ≤ 410				*	X						
Fecal Coliform - No./100 ml		S.V.≤ 1000	X	*			X	X		X			

* = The most restrictive beneficial use.
X = Beneficial use.
a Refer to NAC 445A.122 and 445A.1622 for beneficial use terminology.
b Maximum allowable increase in temperature above water temperature at the boundary of an approved mixing zone, but the increase must not cause a violation of the
c The ambient water quality criteria for ammonia are specified in NAC 445A.118.
A.G.M the annual geometric mean
A-AVG annual average
ΔT change in temperature
S.V. single value

For water bodies listed as impaired, states must assess the amount of pollution that a water body can receive without violating water quality standards. That amount of pollution is termed a Total Maximum Daily Load (TMDL). Loads are then allocated among the different sources, including point sources (or waste load allocation) as well as non-point source natural or background sources (or load allocation) (Stantec, 2011). In 1994, TMDLs for the Truckee River were established for three different constituents: total nitrogen (Total-N), total phosphorus (Total-P), and total dissolved solids (TDS) (**Table 1-9**). The control point for these constituents is the Truckee River at Lockwood. Monitoring of waters in the Truckee River at Lockwood is not a component of this monitoring program, but sampling and analysis is carried out by the Truckee Meadows Water Reclamation Facility

(TMWRF) under a separate NPDES permit, and results are available on the Truckee River Information Gateway (TRIG; http://truckeeriverinfo.org/). Three constituents with TMDLs and other constituents of concern are measured under this stormwater monitoring program at urban outfalls and tributaries to the Truckee River to better understand the quality of waters entering the Truckee River (receiving waters) from Truckee Meadows.

Table 1-9 Total Maximum Daily Loads (TMDLs), Truckee River at Lockwood



Total Maximum Daily Load	**Total Nitrogen**	**Total Phosphorus**	**Total Dissolved Solids**
Point of Compliance	*lbs/day*	*lbs/day*	*lbs/day*
	TMDL		
Truckee River at Lockwood	1,000	214	900,528
	Non-Point Source or Load Allocation		
Truckee River at Lockwood	500	80	780,360

2 SAMPLING AND ANALYSIS PLAN (2018) AND ADDENDUMS

Every year, a revised Sampling and Analysis Plan (SAP) is submitted to the NDEP and outlines the sampling program and approach, including locations of sampling, the stormwater sampling activities to be conducted, and lists of constituents for laboratory analysis. During implementation of the SAP, field realities often necessitate minor modifications to the SAP before a revised SAP can be completed. These revisions are documented in the annual report and/or as addenda to the SAP.

2.1 Sampling and Analysis Plan

In FY2019, Balance conducted the monitoring program based on the 2018 SAP, dated October 2018 (Trustman and others, 2018). The SAP identifies two different sampling activities: (1) scheduled, non-rain event, tributary Baseflow Sampling; and (2) unscheduled Storm event sampling. The 2018 SAP identifies 15 monitoring stations, including 11 tributary monitoring stations on 8 tributaries that require both Baseflow Sampling and unscheduled Storm Event sampling, and 4 urban outfall monitoring sites that require only unscheduled, Storm Event sampling.

All four urban outfalls (Arlington, Oxbow Nature Park, Fisherman's Park II and Mary Wahl Drain) and four selected tributaries (Steamboat Creek, Boynton Slough, Yori Drain and North Truckee Drain) utilize near-continuous streamflow gages and automated samplers to collect multiple samples across a given storm runoff event to characterize constituent loading to the Truckee River. Balance also continued to operate additional streamflow gaging stations on three tributaries to the Truckee River (Chalk Creek, Alum Creek, and Thomas Creek), while Truckee Meadows Water Authority (TMWA) operates and maintains a streamflow gaging station on Whites Creek. Streamflow data helps quantify storm event runoff volumes and is required to calculate instantaneous loading rates at these stations.

2.2 Special Study: Baseflow Sampling and Analysis from Two Main Tributaries

Steamboat Creek and North Truckee Drain have been identified as key sources of excess nutrients to the Truckee River (Shump, 1985, Romeis, 1999, and Hastings and Shaw, 2015). Balance has therefore conducted a multi-year special study to evaluate baseflow nutrient loading from these two tributaries since WY2016. In FY2019, Balance continued to operate four automated samplers, two co-located at USGS streamflow gaging stations (SBC@CWW and NTD@BFD) and two located on tributaries that discharge into Steamboat Creek (BS@SBC and YD@SBC). Data collected at these stations allow for calculation of 24-hour nutrient loading and fulfill the ambient monitoring requirements of this program.

2.3 Constituents of Concern

The 2018 SAP identifies the following constituents of concern:

- Total nitrogen (Total-N),
- Nitrate as nitrogen (NO_3),
- Total Kjeldahl nitrogen (TKN),
- Total phosphorus (Total-P),
- Ortho-phosphate (Ortho-P),
- Total dissolved solids (TDS),
- Total suspended solids (TSS),
- Total Escherichia coli bacteria (*E. coli*), and
- Standard physical parameters including: water temperature, turbidity, pH, dissolved oxygen (DO), and specific conductance (SC).

Below, we define and briefly discuss the importance of these parameters as they relate to stormwater in the Truckee Meadows.

2.3.1 NITROGEN AND PHOSPHORUS

Nitrogen and phosphorus are the principal constituents of concern in urban stormwater. The major sources of these nutrients in urban stormwater are urban landscape runoff, atmospheric deposition, animal waste, improperly functioning septic systems, and/or undertreated wastewater returned to the river (Terrene Institute, 1996). The degree to which nitrogen and phosphorus are present in a river can affect the trophic status and amount of algal biomass produced. Excess nutrients tend to increase primary biological productivity, which in turn cause algal blooms. A secondary impact is the residual negative effects of decomposing algae, which depletes dissolved oxygen concentrations necessary to support other aquatic life (USEPA, 1999).

There are several forms of nitrogen and phosphorus found in stormwater runoff. Total-N includes four forms including NO_3, NO_2, NH_3, and ammonium (NH_4). NO_3 and NO_2 are the inorganic fractions of nitrogen. NO_2 is uncommon in stormwater because it can quickly transform to NO_3 by bacteria. NO_3 is stable over a considerable range of conditions and is readily transported in water. NO_3 is highly toxic to humans and fish at high concentrations and long exposure. NH_3 is more volatile and is quickly converted to NO_2 and NO_3 through oxidation, but usually is the most readily toxic to aquatic life. NH_3 typically reacts or dissolves in water to also form NH_4 at neutral pH levels (i.e., near 7). NH_4 is strongly adsorbed on mineral surfaces or soil particles and can therefore be easily transported by sediment in the water (Hem, 1985).

TKN is a measure of the total concentration of organic nitrogen and ammonia. TKN is a good indicator of forms of nitrogen most readily available to aquatic life. Sources of nitrogen in surface waters include both residential and agricultural fertilizers, septic tanks, leaking sewer lines, and leach fields. Unsanitary disposal of human and pet excrement are also common sources in urban areas and are frequently observed in the Truckee Meadows urban areas.

Total-P is a measure of both organic and inorganic forms of phosphorus. Ortho-P is commonly present in stormwater and the fraction of Total-P that is most immediately biologically available to aquatic life (Hem, 1985). Sources of phosphorus in surface waters include the natural weathering and erosion of local bedrock, especially areas underlain by igneous rocks (e.g., granodiorite, volcanic rocks). Erosion of areas with current (e.g., construction) or historical disturbance (e.g., mining) can exacerbate the concentrations of phosphorus in stormwater. Other sources may include sewage and household detergents, runoff from fertilized lawns and cropland, runoff from animal manure storage areas or drained wetlands, decomposition of organic matter, and commercial cleaning products.

Identification of the source(s) of phosphorus (Total-P and Ortho-P) in tributaries is complicated by multiple possible sources and hydrological, geochemical, and biological processes affecting phosphorus fate and transport (Denver and others, 2010). Romeis (1999) identified multiple possible sources of excess phosphorus to Steamboat Creek that included: Livestock, fertilizers, irrigation return flows, leaking septic systems and/or bank erosion. Concentrations of phosphorus (as phosphate) have been measured in geothermal wells in the Truckee Meadows region (Great Basin Groundwater Geochemical Database, 2016), while Shump (1985) and Skalbeck and others (2002) have established that some tributaries, including Steamboat Creek, are gaining streams and receive groundwater from both non-thermal and thermal waters. The link between these possible sources and transport is, however poorly understood, and additional investigations into the source(s) of elevated phosphorus (Total-P and Ortho-P) concentrations are warranted.

2.3.2 Suspended and Dissolved Solids

TSS is a measure of both organic and inorganic solids suspended in the water column, whereas TDS is a measure of all inorganic and organic substances dissolved in the water column (Hem, 1985). Both TSS and TDS have been reported to increase in waters that receive urban stormwater. Their concentrations originate from many sources including erosion of pervious surfaces, dust, litter, other particles deposited on impervious surfaces from human activities, sediment runoff at construction sites, and streambank erosion (Burton and Pitt, 2002).

Elevated TSS and TDS concentrations increase turbidity, reduce light penetration in streams, and limit the growth of desirable aquatic plants. TSS can settle in backwater areas or in the main channel during periods of low flow and can alter or impair aquatic habitat and aquatic life. TSS can also provide a medium for accumulation, transport, and storage of other pollutants including nutrients and metals (USEPA, 1999).

Although TSS and TDS are not typically associated with human health effects, they are used as aesthetic indicators as well as aggregate indicators of the presence of chemical contaminants. Concentrations can also be naturally elevated from natural erosion of geologic sources. For instance, naturally high sulfates are found in the Chalk Creek watershed and commonly are a source of high TDS concentrations. Increases over background TSS and/or TDS may originate from agricultural and residential runoff as well as point-source pollution discharge from industrial and sewage treatment plants. Most aquatic ecosystems can tolerate TDS levels of 1,000 mg/L (Boyd, 1999).

2.3.3 Pathogens

Pathogens are disease-producing organisms that present a potential public health threat when they are present in waters (USEPA, 1999). Pathogens typically originate from warm-blooded animal excrement which can include wild animals, urban animals (e.g., pigeons, raccoons, crows, dogs), or humans (i.e., raw sewage spills). Direct exposure to pathogens in stormwater is usually limited; however, when runoff is discharged to recreational waters such as the Truckee River, there is a potential public health risk. Runoff can contain many different pathogens that cannot be measured directly; therefore, indicator organisms such as *E. coli* are used to predict the health risks (NDEP, 2012). High counts of bacteria may not necessarily confirm the presence of pathogens but provides an indicator for risk. In this report, bacteria measured is reported in units of Most Probable Number (MPN) per 100 mL of water.

2.3.4 OTHER PHYSICAL PARAMETERS

Standard physical parameters provide additional context for stormwater quality and conditions relative to receiving waters. In addition, NDEP has water quality standards for physical parameters including temperature, dissolved oxygen, and pH for the Truckee River and listed tributaries (NAC 445a.).

Water temperature is an important measure of water quality and the Truckee River is listed as impaired for water temperature (NDEP, 2016). Specifically, water holds less oxygen as it becomes warmer, resulting in less oxygen available for respiration by aquatic organisms (USEPA, 1999). Stormwater runoff from high-temperature impervious surfaces can increase water temperature in the river or receiving waters and impair trout species (Jones and others, 2007).

Dissolved oxygen (DO) concentration is a measure of the amount of oxygen dissolved in water. DO is critical to biological organisms and fish. High DO levels in streams are needed to sustain the more sensitive biological organisms (MacDonald and others, 1991). Low DO levels are commonly associated with point source pollution or decomposing organic matter in the water column. Urban stormwater typically has low to moderate DO levels but DO commonly increases when diluted in receiving waters. As mentioned earlier, decomposing algae—from increased nutrient loads—can deplete DO concentrations to the point where aquatic life is affected. Waters rich in algae (eutrophic) can register wide swings in DO concentrations between algae respiration at night and photosynthesis during daylight hours. Wide diurnal fluctuations can stress aquatic life more than constant low DO concentrations. Conversely, DO can be supersaturated (greater than 100%) due to production of pure oxygen by photosynthetically-active organisms. In rare cases, supersaturated DO or excess DO can be harmful to some fish species (Jones 2011).

Most aquatic ecosystems are also sensitive to variations in pH. Most pH impacts in urban waters are caused by runoff of rainwater with low pH levels (USEPA, 1999) or rapid changes in water temperatures (i.e., runoff heated by sun-warmed asphalt). Urban and industrial areas tend to have more acidic rainfall than less developed areas. Additionally, high pH levels can be caused by eutrophication or abundance of nutrients in waters.

Specific conductance (SC) of waters refers to the ability of water to conduct an electrical current and is related to the concentration of dissolved solids. SC indicates the quantity of dissolved ions in the water and can also be used as a proxy for salinity. While there are no recommended water quality criteria for conductivity, it can be used as a surrogate for TDS and other dissolved ions. SC can exhibit a wide range if waters move through areas of differing geology. Waters that drain granitic and/or volcanic rocks tend to have a very low SC (< 400 µS (micro Siemens). Alternatively, waters that drain marine sedimentary rocks (e.g., Chalk Creek) or geothermal areas (e.g., Steamboat Creek) will typically have a much higher SC (>2,000 µS). The acceptable range for fresh water fish is between 100 and 2,000 µS (MacDonald and others, 1991).

3 STORM MONITORING STATIONS

The FY2019 stormwater monitoring program includes a total of 15 monitoring stations per the 2018 SAP: 11 tributary stations, and 4 stormwater urban outfall stations. Locations of monitoring stations, rain gages, and streamflow gages used for this monitoring program are shown in **Figure 3-1**. **Table 3-1** describes the characteristics of the sites and their drainage areas, including land-uses, constituents of concern, instrumentation, comments, and known existing studies. We have used information summarized in recent watershed assessments, special studies, zoning maps from Washoe County, stormwater system maps from Cities of Reno and Sparks, aerial imagery available on Google Earth®, and field observations to establish the drainage areas for each monitoring station.

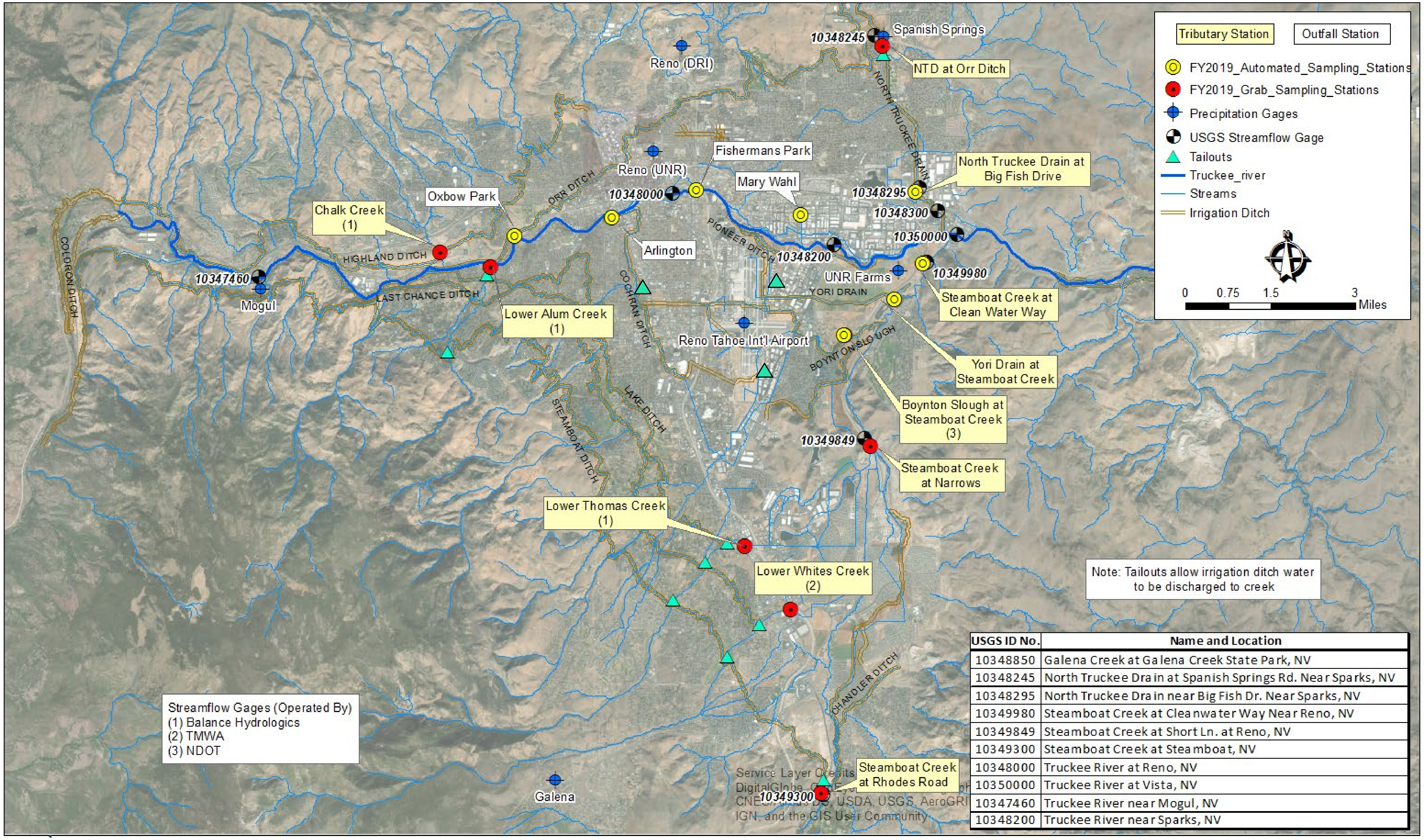
3.1 Tributary Stations

The 2018 SAP establishes 11 monitoring stations across 8 tributaries. Two of the largest tributaries, Steamboat Creek and North Truckee Drain, have more than one monitoring station along the mainstem of each stream, allowing for evaluation of possible water-quality degradation from specific sub-watersheds. Furthermore, 4 tributary stations flow to Steamboat Creek: Yori Drain, Boynton Slough, Thomas Creek, and Whites Creek.

Delineation of drainage areas for tributary monitoring stations is confounded in many cases by irrigation ditches that divert waters from the Truckee River upstream of the Truckee Meadows, receive stormwater runoff from intervening areas, then discharge water to other tributaries, or ‘tailwaters,’ at ‘tailouts’ and may affect water quality in the receiving tributary. Although water quality of tailwaters has not been investigated as part of this study, awareness of this confounding factor is required during interpretation of hydrology and water quality at affected monitoring sites. **Table 3-2** lists the locations where tailouts exist or where irrigation ditches can discharge to tributaries. These locations are also identified in **Figure 3-1**.

3.2 Stormwater Outfall Stations

The 2018 SAP identifies 4 stormwater urban outfalls as monitoring stations. Stormwater quality from discharge at these outfalls can affect water quality and beneficial uses in receiving waters of the Truckee River. Analysis of water quality from stormwater outfalls provides a perspective on the concentrations and loading from these point sources and can also be compared to water quality from monitored tributaries.



Note: Tailouts allow irrigation ditch water to be discharged to creek

Streamflow Gages (Operated By)
(1) Balance Hydrologics
(2) TMWA
(3) NDOT

USGS ID No.	Name and Location
10348850	Galena Creek at Galena Creek State Park, NV
10348245	North Truckee Drain at Spanish Springs Rd. Near Sparks, NV
10348295	North Truckee Drain near Big Fish Dr. Near Sparks, NV
10349980	Steamboat Creek at Cleanwater Way Near Reno, NV
10349849	Steamboat Creek at Short Ln. at Reno, NV
10349300	Steamboat Creek at Steamboat, NV
10348000	Truckee River at Reno, NV
10350000	Truckee River at Vista, NV
10347460	Truckee River near Mogul, NV
10348200	Truckee River near Sparks, NV

Figure 3-1 Truckee Meadows Stormwater Monitoring Stations, Streamflow Gaging Stations, Rain Gages, and Station Equipment, FY2019

Table 3-1 Monitoring Locations and Characteristics, Truckee Meadows Stormwater Monitoring Program, FY2019

Monitoring Station Name	Station ID	Watershed	Watershed Area (mi^2)	Primary Land-Uses	303(d) listed constituents	Instrumentation	Comments	Existing Studies
Tributaries								
Chalk Creek at Chalk Bluff	CC@CB	Tributary to Truckee River	4.6	Upper watershed is undeveloped; lower watershed is residential; I-80 and some commercial	OP, Total-P, NO_3, Temp., TDS, TSS, sulfates, Selenium	Adjustable weir, staff plate	Watershed includes geology of the Hunter Creek Formation: diatomaceous fine sandstone or "chalk" and lacustrine deposits which bear high concentrations of sulfates	JBR Environmental, 2010
Alum Creek at Truckee River	AC@TR	Tributary to Truckee River	4.9	Residential, commercial, open space	pH, Temp., TDS, TSS, OP, Total-P	Staff plate	Watershed geology includes Hunter Creek Formation, hydrous aluminum sulfates. 2007 Hawkin Fire burned 1,000 acres in upper watershed; artifical irrigation ponds provide some flood detention; Steamboat Ditch discharges to creek at times.	Fennema, 2013; Jesch, 2008 and 2011
Alum Creek at Steamboat Ditch	AC@SBD	Tributary to Truckee River	2.35	Open space	pH, Temp., TDS, TSS, OP, Total-P	Staff plate	see above	see above
North Truckee Drain at Orr Ditch	NTD@ORD	Tributary to Truckee River	76.1	agriculture, residential, and commercial	--	USGS gaging station 10348245	Receives return flows from irrigation ditches; drains much of Spanish Springs Valley; part of USACE flood control project	Jesch, 2005
North Truckee Drain at Kleppe Ln	NTD@KLP	Tributary to Truckee River	n/a	agriculture, residential, commercial, industrial, I-80	Total-P, Total-N, TDS (Sparks Marina)	USGS gaging station 10348300	Receives drainage from Sparks Marina which has experienced recent water quality issues and fish kills;	Jesch, 2005
Thomas Creek at Timberline Dr.	TC@TLD	Tributary to Steamboat Creek	7.5	Open space	arsenic and boron	Staff plate	Upper watershed includes Mt. Rose and wilderness (9,000 ft elev.) subject to snowpack and spring snowmelt runoff. Trails and unpaved roads have been identified as sediment sources	Jesch, 2011
Thomas Creek at S. Meadows Pkwy	TC@SMP	Tributary to Steamboat Creek	18.5	Mixed residential and commercial, some small agriculture, golf course, new construction	arsenic and boron	Staff plate	Lower portions of creek are conveyed via concrete or lined flood control channels, culverts and ditches;	Jesch, 2011, Curtis, 2013
Whites Creek at Timberline Dr.	WC@TLD	Tributary to Steamboat Creek	7.9	Residential, commercial, golf course, new construction, open space	pH, Total-P, *E. Coli*	Staff plate	Upper watershed includes Mt. Rose and wilderness (9,000 ft elev.) subject to snowpack and spring snowmelt runoff; active recreation area	Jesch, 2011
Whites Creek at Old Virginia Hwy	WC@OVH	Tributary to Steamboat Creek	18.5	Open space	pH, Total-P, *E. Coli*	Staff plate	Additional 303(d) listed constituents for downstream reaches; channel is actively eroding in segments and increasing with increased urbanization of watershed	Jesch, 2011
Steamboat Creek at Rhodes Road	SBC@RHR	Tributary to Truckee River	123	Rural residential; HWY 395, historic gold and silver mining; geothermal operations	*E. coli*	USGS gaging station 10349300	Washoe Lake located short distance upstream	Parametrix and Wenk Associates, 2007
Steamboat Creek at Narrows	SBC@NAR	Tributary to Truckee River	192	Mixed residential-commercial, HWY 395, agriculture, historic gold and silver mining; geothermal operations, new construction	*E. coli* , boron, arsenic, iron	USGS gaging station 10349849	Downstream from hot springs and geothermal operations; channel in poor condition	Parametrix and Wenk Associates, 2007
Steamboat Creek at Clean Water Way	SBC@CWW	Tributary to Truckee River	244	Mixed residential-commercial, HWY 395, agriculture, golf courses, historic mining; geothermal operations, new construction, Reno-Tahoe Airport	*E. coli* , boron, arsenic, iron	USGS gaging station 10349980	Construction (current) of new highway in lower watershed;	Parametrix and Wenk Associates, 2007
Urban Outfalls								
Arlington	H-19	Outfalls to Truckee River	0.32	Residential (single family), commercial with urban landscaping	n/a	ISCO automated sampler and area-velocity module	One of the oldest neighborhoods in Reno; most homes built before 1940; possible cross connections with domestic sewer lines; sampling location is an outfall directly to Truckee River	n/a
Fisherman's Park II	D-16	Outfalls to Truckee River	5.1	Mixed residential, commercial, industrial and some agriculture, I-80, I-580, UPRR and new construction	n/a	ISCO automated sampler and area-velocity module	Area drains portions of University of Nevada-Reno, Nevada State Fair Grounds, U.S. Agriculture Research Services; sampling location is an outfall directly to the Truckee River	n/a
Oxbow Nature Park	C-24	Outfalls to Truckee River	0.36	Residential (single family and multi-family units), commercial and urban landscaping	n/a	ISCO automated sampler and area-velocity module	Drainage area is 100 percent built out with an estimated 85+ percent impervious surface; access is via a storm drain manhole cover approximately 400 feet from outfall to the Truckee River	n/a
Mary Wahl Ditch	SDOE-008936	Outfalls to Truckee River	n/a	Mixed residential, commercial, industrial and some agriculture, I-80, UPRR and new construction	n/a	ISCO automated sampler and area-velocity module	Recently enclosed in a concrete box culvert (December, 2014); culvert accumulates sediment; sampling location is a manhole roughly 750 feet upstream of the outfall to the Truckee River	n/a
Cottonwood Park	SDOE-008957	Outfalls to Truckee River	n/a	Mixed commercial-industrial	n/a	--	Drains an area nearly 90+ percent impervious; sampling location is a manhole roughly 250 feet from the outfall to the Truckee River	n/a
Greg Street	SDOE-008960	Outfalls to Truckee River	n/a	Mixed commercial-industrial	n/a	--	Sampling location is a manhole roughly 500 feet upstream of the outfall to the Truckee River	n/a
Paradise Park	C-15	Outfalls to Truckee River	n/a	mixed residential, commercial and industrial	n/a	--	Sampling location is the overflow point from several urban detention ponds; sampling location is approximately 0.75 miles upstream of the outfall to the Truckee River	n/a

Table 3-2 Tributary Monitoring Sites Receiving Tailwaters from Irrigation Ditches

Irrigation Ditch	Monitoring Sites that Receive Tailwaters
Steamboat Ditch	Alum Creek at Truckee River
	Thomas Creek at S. Meadows Parkway
	Whites Creek at Old Virginia Highway
	Steamboat Creek at Narrows and Clean Water
Last Chance Ditch	Alum Creek at Truckee River
	Thomas Creek at S. Meadows Parkway
	Whites Creek at Old Virginia Highway
Lake Ditch	Thomas Creek at S. Meadows Parkway
	Alum Creek at Truckee River
Orr Ditch	North Truckee Drain at Orr Ditch
	North Truckee Drain at Big Fish Drive
Cochrane Ditch	Steamboat Creek at Clean Water Way
	Boynton Slough at Steamboat Creek
Pioneer Ditch	Yori Drain at Steamboat Creek

Notes: See **Figure 3-1** for locations of ditches and diversions to tributaries.

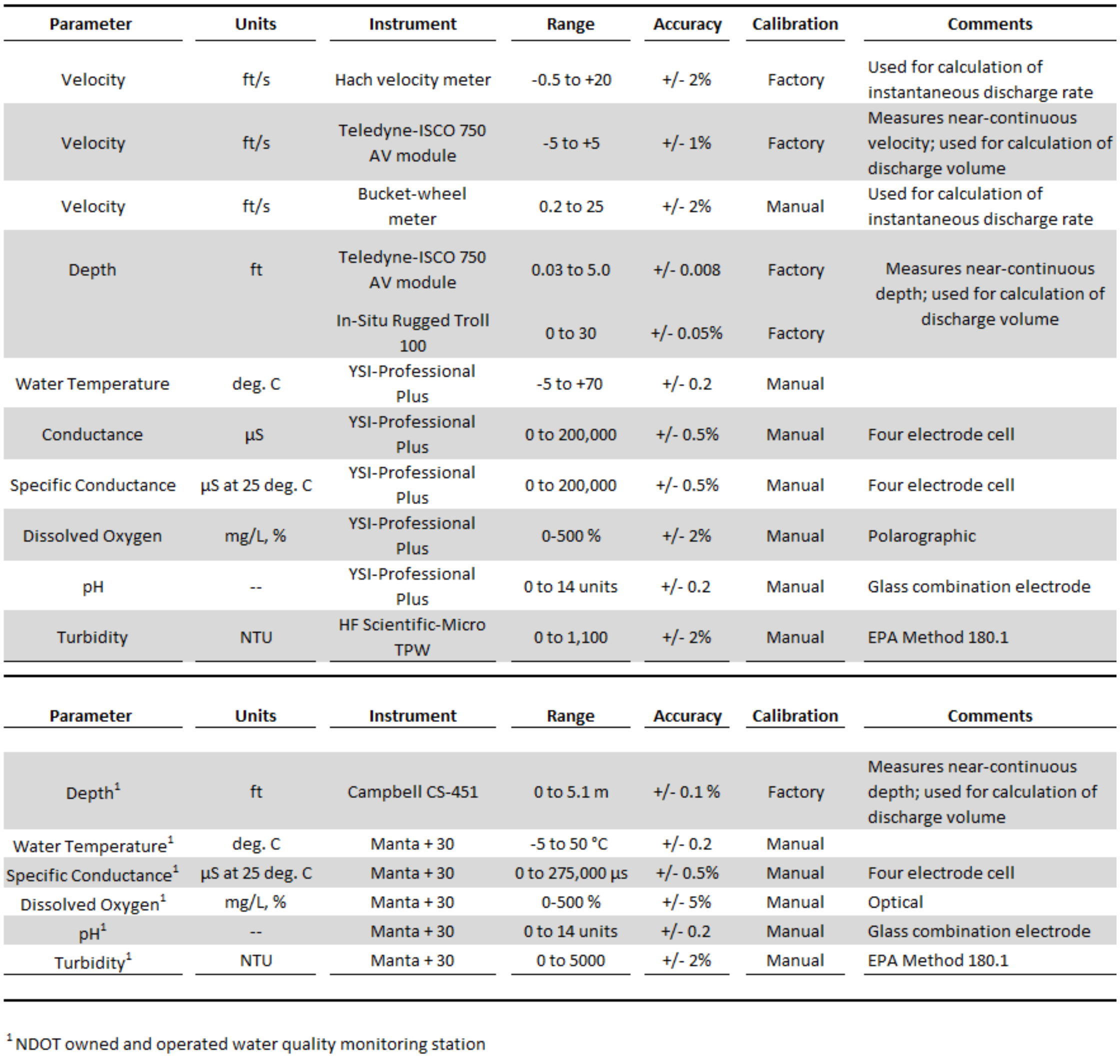
4 STORM MONITORING PROGRAM METHODS

This chapter describes the sampling equipment and methods used to collect water quality samples, measure and gage discharge or streamflow, and measure physical parameters of stormwater.

4.1 Types of Equipment

Table 4-1 lists the field parameters measured, instruments used, and the resolution and accuracy of each instrument.

Table 4-1 Instruments Used to Measure Water Quality, Runoff and Physical Parameters during Storm Events



Parameter	Units	Instrument	Range	Accuracy	Calibration	Comments
Velocity	ft/s	Hach velocity meter	-0.5 to +20	+/- 2%	Factory	Used for calculation of instantaneous discharge rate
Velocity	ft/s	Teledyne-ISCO 750 AV module	-5 to +5	+/- 1%	Factory	Measures near-continuous velocity; used for calculation of discharge volume
Velocity	ft/s	Bucket-wheel meter	0.2 to 25	+/- 2%	Manual	Used for calculation of instantaneous discharge rate
Depth	ft	Teledyne-ISCO 750 AV module	0.03 to 5.0	+/- 0.008	Factory	Measures near-continuous depth; used for calculation of discharge volume
		In-Situ Rugged Troll 100	0 to 30	+/- 0.05%	Factory	
Water Temperature	deg. C	YSI-Professional Plus	-5 to +70	+/- 0.2	Manual	
Conductance	µS	YSI-Professional Plus	0 to 200,000	+/- 0.5%	Manual	Four electrode cell
Specific Conductance	µS at 25 deg. C	YSI-Professional Plus	0 to 200,000	+/- 0.5%	Manual	Four electrode cell
Dissolved Oxygen	mg/L, %	YSI-Professional Plus	0-500 %	+/- 2%	Manual	Polarographic
pH	--	YSI-Professional Plus	0 to 14 units	+/- 0.2	Manual	Glass combination electrode
Turbidity	NTU	HF Scientific-Micro TPW	0 to 1,100	+/- 2%	Manual	EPA Method 180.1
Parameter	**Units**	**Instrument**	**Range**	**Accuracy**	**Calibration**	**Comments**
Depth[1]	ft	Campbell CS-451	0 to 5.1 m	+/- 0.1 %	Factory	Measures near-continuous depth; used for calculation of discharge volume
Water Temperature[1]	deg. C	Manta + 30	-5 to 50 °C	+/- 0.2	Manual	
Specific Conductance[1]	µS at 25 deg. C	Manta + 30	0 to 275,000 µs	+/- 0.5%	Manual	Four electrode cell
Dissolved Oxygen[1]	mg/L, %	Manta + 30	0-500 %	+/- 5%	Manual	Optical
pH[1]	--	Manta + 30	0 to 14 units	+/- 0.2	Manual	Glass combination electrode
Turbidity[1]	NTU	Manta + 30	0 to 5000	+/- 2%	Manual	EPA Method 180.1

[1] NDOT owned and operated water quality monitoring station

4.2 Sampling Procedures

Storm event samples were collected using a variety of methods depending on the site and instrumentation. Samples collected at automated sampling stations used either time-interval or flow-interval techniques to automatically fill discrete sample bottles over the duration of the storm hydrograph. This method is further described in **Section 4.4**, below; other sites require grab samples. Unless otherwise noted, grab samples were collected using a clean, triple-rinsed container, and were collected, composited, and mixed to fill laboratory-required volumes and laboratory-supplied bottles.

When site conditions permitted, Balance staff used a hand-held DH-48 sampler with a 1/4-inch nozzle, as adopted by the Federal Interagency Sedimentation Project (FISP), to capture a depth-integrated sample of water across the width of an open channel or pipe. Water samples were collected using the Equal Transit Rate (ETR) method such that each sample was collected by raising and lowering the sampler at a number of equally-spaced verticals across the stream channel or pipe; collection in each vertical was integrated across the full depth of the water column; and a constant transit rate was maintained while raising and lowering the equipment until the sample bottle was just less than full (Edwards and Glysson, 1999). Water samples were typically collected from between three and eight verticals, and each vertical was executed within 5 to 15 seconds, for a total of approximately 30 to 60 elapsed seconds per sample.

All storm and baseflow samples collected during an event were delivered to Western Environmental Testing Laboratory (WETLab) in Sparks, Nevada under Chain-of-Custody (COC) procedures. Sample processing and procedures were completed as outlined in the 2018 SAP.

4.3 Streamflow/Discharge Gaging

Under this program, Balance operates and maintains three streamflow gaging stations and works with NDOT to operate a fourth station using standard hydrologic practices. The primary purpose of the gaging stations is to record near-continuous streamflow and quantify constituent loading during sampled storm events. Four stations are equipped with Type C staff plates that indicate water stage and In-Situ® and Campbell Scientific® pressure transducers that record water pressure depth. Near-continuous records of water pressure depth are converted to stage (in feet) and calibrated with each observation. Manual measurements of streamflow are completed over a range of stages to develop a stage-to-streamflow rating curve. The rating curve is used to convert the near-continuous record of stage to a near-continuous record of streamflow. If channel conditions suggest a change in the stage-to-streamflow rating curve, a stage shift is applied when appropriate.

A fifth gaging station is located within a culvert or pipe (Yori Drain) and equipped with an ISCO 750 velocity-area module. The module records velocities and water depths every 10 seconds and averages them into 5-minute near-continuous records. The ISCO program converts water depths into a cross-sectional area using a known culvert diameter and calculates discharge or streamflow using the Continuity Equation (flow = area x velocity). As a check on the velocity-area, in-program calculation, a secondary computation of discharge is also computed using a standard pipe flow equation with the near-continuous water depth data and manual measurements of pipe diameter and slope.

While every effort is made to collect near-continuous, accurate data, we identify the following possible limitations of this program and gaging in urban systems:

- Site visits may be limited to less than 6 times per year and may not document some changes in conditions that affect flow (e.g., channel erosion, sediment or garbage accumulation in a culvert, vandalism, stream depths that are lower than instrument sensor, etc.).
- Some gaging stations are near confluences with larger tributaries or the Truckee River and therefore backwatering can occur. In these cases, efforts are made to identify periods of backwatering and replace erroneous data with periods of estimated streamflow or discharge.
- The gaging program is not intended to be used to quantify flood magnitude, frequency or recurrence intervals. Oftentimes urban flooding generates unsafe conditions to access the gage. Moreover, while stormwater can cause flooding, not all floodwaters are stormwater and sampling floodwaters may be inappropriate for the purposes of this program.

4.4 Manual Streamflow/Discharge Measurements

Balance utilized standard streamflow equipment and practices appropriate for the conditions encountered in the field (Carter and Davidian, 1968). Discharge was measured or estimated each time stormwater was sampled. A digital velocity meter was used to measure velocity and compute instantaneous stormwater discharge in closed stormwater systems (i.e., pipes) accessed by a manhole, whereas a pygmy, standard

Price AA (bucket-wheel) meter or a digital velocity meter was used in open channel systems. The Mid-Section Method for computing cross-sectional flow area using multiple verticals and the Six-Tenths-Depth Method for computing mean velocity at each vertical were used (Turnipseed and Sauer, 2010). A minimum of 2 verticals was used to measure velocity in a pipe. A minimum of 4 verticals was used to measure channel depth and velocity in open channels. The total number of verticals was established based on how quickly water depth was changing. Each open channel monitoring station includes a staff plate, which allowed for a consistent datum to be used for stage readings. The cross-sectional area of the pipe or open channel was then multiplied by the velocity measured at the cross-section to compute an instantaneous discharge. Streamflow estimates were completed using measured flow widths (ft) and depths (ft) and measurements of surface velocity using a float's movement across a known distance with a stopwatch (ft/sec).

4.5 Automated Sampling and Discharge Computation

In FY2019, Balance operated and maintained Teledyne-ISCO® automated samplers at 8 Stations (4 stormwater urban outfall stations and 4 tributaries):

1. Arlington (H-19);
2. Oxbow Nature Park (C-24);
3. Fisherman's Park II (D-16);
4. Mary Wahl Drain (SDOE-008936);
5. Yori Drain at Steamboat Creek (YD@SBC);
6. Boynton Slough at Steamboat Creek (BS@SBC);
7. North Truckee Drain at Big Fish Drive (NTD@BFD); and
8. Steamboat Creek at Clean Water Way (SBC@CWW).

Automated samplers at 5 of these stations (1through 5, above) are equipped with ISCO® 750 area-velocity module, which allows for computation of discharge rates and discharge volume for the duration of sampled events. Automated samplers were programmed to measure stormwater depth and velocity every 5 minutes and initiate sampling once an increase in flow was detected.

Rainfall depth-runoff volume rating-curves were established at each stormwater urban outfall in an effort to use flow-weighted sampling techniques—such that samples are automatically collected at intervals of equal runoff volume. Harmel and others (2003) note that flow-weighted sampling best represents storm loads because a greater number of samples are collected at higher flow rates.

The Yori Drain station YD@SBC hydrology is complicated by the fact that it can receive a significant volume of discharge from the Truckee River via the Pioneer Ditch. These discharges are not based on precipitation but are controlled by diversion operations. As such, flow-weighted sampling is not possible and time-weighted sampling is performed.

The Boynton Slough station BS@SBC is outfitted with Campbell Scientific pressure transducers owned and operated by NDOT. A stage to discharge relationship, as described above, is used to create a record of flow. FY2019 was the first year this monitoring station was equipped and the development of the stage to discharge relationship was created over the course of the year. Without a developed relationship in FY2019, the automated sampler was programmed for time-weighted sampling. In the future flow weighted programming using the Campbell data logger and a rain to runoff relationship will be used with the auto sampler.

The 2 remaining stations, SBC@CWW and NTD@BFD included automated samplers co-located with USGS stream gages and programmed for time-weighted sampling. Samples were collected at equal time intervals based on the anticipated duration of the storm-runoff event. Time intervals ranged between 30 minutes and 2 hours, times were changed to a more or less frequent interval after sampling has been initiated to accommodate changes in the event and appropriately characterize stormwater quality.

Following each sampling event, the storm hydrograph and timing of sample collection were examined at all automated sampling stations in order to evaluate which samples best captured different portions of the storm hydrograph. Discrete samples were composited into 4 final samples, each representing a component of the hydrograph: 1) first flush, 2) rising limb, 3) peak discharge, and 4) falling limb. Composites were used to fill laboratory-provided bottles and delivered to the laboratory in accordance with the 2018 SAP. Physical water quality parameters were measured directly[2] from the source upon readying the sampler and upon retrieving samples.

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[2] Efforts are made to measure physical water quality parameters directly from the runoff source; however, runoff may not be active at some locations (e.g., urban outfalls) upon each site visit (e.g., processing samples from an automated sampler). In these cases, parameters are measured directly from the composited samples; Some data may therefore not be representative of the runoff source due to the residence time of samples in the sampler.

In FY2019, Balance operated and maintained 4 near-continuous streamflow gaging stations on monitored tributaries: (1) Chalk Creek at Chalk Bluff (CC@CB); (2) Alum Creek at Mayberry Drive (AC@MAB); (3) Thomas Creek at South Meadows Parkway (TC@SMP); and (4) Yori Drain at Steamboat Creek (YD@SBC). The AC@MAB gaging station is for stream gaging only, all stormwater samples are collected downstream at the AC@TR site for consistency with previous years. The AC@TR stream gage had to be relocated due to changes in the channel that inhibited the collection of accurate stage and flow data. Flow measurements are collected with water quality samples at the AC@TR station for calculating instantaneous loads. NDOT operated and maintained one near-continuous streamflow gage at Boynton Slough at Steamboat Creek. NDOT recorded stage and Balance was responsible for the creation of the stage to discharge relationship to complete the flow record. Near-continuous streamflow records (15-minute data) were collected for all stations except Yori Drain. Near-continuous streamflow data were collected at 5-minute intervals for Yori Drain. All stations were calibrated with manual observations of stage and stage shifts were applied where appropriate to produce an annual hydrograph at each station. Annual hydrographs from other monitored tributary stations were sourced from near-continuous streamflow gaging stations operated and maintained by the US Geological Survey (USGS) or Truckee Meadows Water Authority (TMWA). Instantaneous and cumulative streamflow volumes measured at all stations together with sampled constituent concentrations were used to calculate instantaneous, daily, and/or total storm loads.

4.6 Calculation of Constituent Loads and Yields

Constituent concentrations from grab samples only provide limited information on the range of concentrations in a single storm event for a given location. We know from the collection of grab samples over an entire hydrograph for a single event, concentrations can range from one to three orders of magnitude, depending on the constituent. Ultimately, the grab sample or ‘snapshot’ approach leaves many gaps in characterization of the system (McKay and others, 2013). Instantaneous discharge measured at the time of sample collection can improve our knowledge because it provides a measure of instantaneous load; however, without information about the range of likely concentrations over a runoff event or season, this technique provides limited information.

Calculation of constituent loads for a given event is a key objective for many non-point source monitoring projects and is usually a more meaningful indicator than constituent concentration. Constituent loads are a measure of mass transported over time, and can only be calculated when both the constituent concentration (mass/volume of water) and discharge (volume of water/time) are known:

Load (lbs.) = stormwater discharge volume (cubic feet) x concentration (mg/L) x conversion coefficient

Once loads are calculated, they can then be compared to TMDLs established for the Truckee River.

4.7 Quality Assurance and Quality Control

The 2018 SAP outlines a quality assurance and quality control (QA/QC) project plan. Balance followed this plan using a combination of field quality control activities and data assessment and validation techniques during the monitoring program. Field quality control activities included: a) assigning a minimum of one senior and experienced staff to each field team, both members of which are trained in stormwater sampling procedures and streamflow or discharge measurements; b) adherence to approved methods and procedures; c) pre- and post-event calibration of field equipment and instruments; d) field collection and analysis of duplicates and bottle blanks, and; e) complete documentation of sampling and observations.

All site visits, staff present, and observations were documented in observer logs and are provided in **Appendix A**. All field equipment and instruments were calibrated before and after each storm and records of calibrations are provided in **Appendix B**.

Separately, Balance designated a staff member who was not involved with the field activities to perform a review of all collected data, calculations, and laboratory results, in accordance with the Quality Assurance and Quality Control (QA/QC) procedures in the 2018 SAP.

4.8 Deviations from the Sampling and Analysis Plan

Weather conditions, hydrologic response, time of day, and/or need for expediency occasionally required deviations from procedures set forth in the 2018 SAP. The following are deviations from the 2018 SAP during the FY2019 monitoring year:

- Stormwater sampling excluded analysis for *E. coli* during many events because the laboratory hold times could not be met when storm sampling was conducted after hours and on weekends.

- In some cases, where automated samplers are used, samples were not collected during one or more segments of the storm hydrograph (i.e., rising limb, peak flow, etc.) as the result of instrument malfunction, power loss, and/or insufficient sample volume. In these cases, loads reported are underestimates of the actual load. This occurred at Mary Wahl (SDOE-008936) for both storms sampled and at Yori Drain (YD@SBC) during the February 2, 2019 storm event. Concentrations for these events are still reported.
- Some stations can be subject to backwatering from downstream flooding on the Truckee River and Steamboat Creek. This occurred during the January 16-17, 2019 at Yori Drain. As a result, the auto-sampler was moved upstream of backwater-influenced waters to characterize the storm event water quality.

5 MONITORING RESULTS FY2019

Below, we describe total precipitation for FY2019, characterize the storms targeted for sampling and the regional hydrologic response, and conclude with a summary of results for constituent concentrations and calculated instantaneous daily, and total storm loads. Analytical results are presented graphically for visual analysis herein. The tabular results and laboratory reports can be found in **Appendix C** and **Appendix D**, respectively.

5.1 Work Conducted in FY2019

In accordance with the 2018 SAP, Balance collected 2 storm event samples at all 15 monitoring stations across 4 different storms. (**Table 5-1**). Separately, baseflow or ambient samples were collected at all the tributary stations on September 4-7, 2018 to characterize summer baseflow and on March 18-19, 2019 to characterize winter baseflow. Summer baseflow coincides with the irrigation season (April to October). Baseflow conditions were defined as a non-storm period with a minimum of 10 consecutive dry days preceding the day of sampling.

Table 5-1 Storm Events and Baseflow Sampled in FY2019 and Stations Sampled in Each Event

Fiscal Year 2019 (July 1, 2018 - June 30, 2019)		Baseflow		Stormwater				
		September 4-7, 2018	***March 18-19, 2019***	***October 3, 2018***	***November 21-22, 2018***	***January 16-17, 2019***	***February 2, 2019***	FY2019 Sample Count
Station	*Station ID*	*Summer*	*Winter*					
Tributaries								
Steamboat Cr at Rhodes Rd	SBC@RR	X	X			X	X	2
Steamboat Cr at Narrows	SBC@NAR	X	X			X	X	2
Steamboat Cr at Clean Water Way	SBC@CWW	X	X			X	X	2
Whites Cr at Old Virginia Hwy	WC@OVH	X	X			X	X	2
Thomas Cr at S. Meadows Pkwy	TC@SMP	X	X	X		X		2
North Truckee Drain at Orr Ditch	NTD@ORD	X	X			X	X	2
North Truckee Drain at Big Fish Dr.	NTD@BFD	X	X			X	X	2
Chalk Cr at Chalk Bluff	CC@CB	X	X			X	X	2
Alum Creek at Truckee River	AC@TR	X	X			X	X	2
Yori Drain at Steamboat Creek	YD@SBC	X	X		X	X	X**	3
Boynton Slough at Steamboat Creek	BS@SBC	X	X			X*	X	2
Urban Outfalls								
Oxbow Nature Park	C-24	NA	NA		X	X		2
Arlington	H-19	NA	NA		X	X		2
Fisherman's Park II	D-16	NA	NA		X	X		2
Mary Wahl Ditch	SDOE008936	NA	NA		X	X*		2

Notes:

X =Denotes that samples were collected at this station during the identified storm event

NA =Not applicable; stormwater urban outfalls do not exhibit baseflow

* Grab sample collected in absence of continuous data and/or continuous sampling.

** A third storm sample was collected at Yori Drain at Steamboat Creek to facilitate a comparison of loads between Boynton at Yori and the total load measured at Steamboat Creek at Clean Water Way in a single event. Unfortunately, an equipment malfunction occurred and no flow data was available from Yori Drain. Concentration data are still reported.

5.2 Precipitation Summary FY2019

Due to the spatial and temporal variability in rainfall across the Truckee Meadows, precipitation data used for this study were evaluated from 6 precipitation stations (see **Figure 3-1**). Cumulative daily precipitation across stations is compared in **Figure 5-1** and highlights the spatial variability of precipitation in the Truckee Meadows in FY2019, as associated with storm type (i.e. frontal, convective, etc.) and storm direction. Most storms having a west to east direction result in a rain-shadow effect in which less rainfall is observed further east of the Carson Range mountain front. During isolated summer thunderstorms, measurable rainfall may fall on some portions of the Truckee Meadows while other areas receive none. Across the Truckee Meadows total annual precipitation in FY2019 ranged from as low as 7.22 inches in North Truckee Drain at Orr Ditch (North

Sparks) to 15.58 inches in Mogul (West of Reno), illustrating the rain-shadow effect. Precipitation spatial variability in each storm sampled is shown in **Table 5-2** and further highlights the rain shadow effect across the Truckee Meadows. For instance, the January 16-17, 2019 storm exhibited between 0.51 inches (North Truckee Drain at Orr Ditch) and 2.24 inches (Mogul). FY2019 annual precipitation at the Reno-Tahoe International Airport, centrally located in the Truckee Meadows, was 12.07 inches, above the long-term climate normal precipitation (7.40 inches; 1981-2010) for this station.

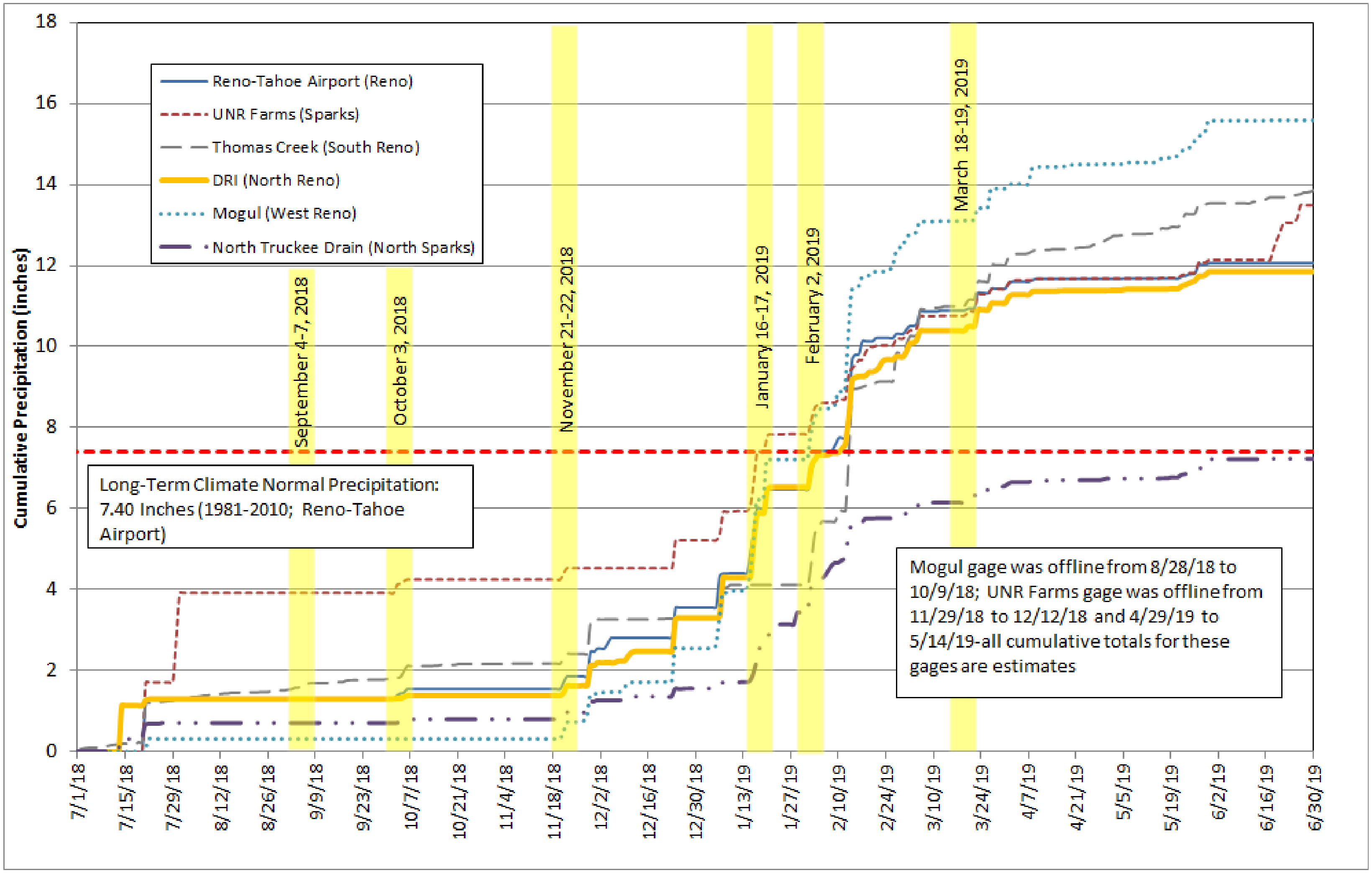
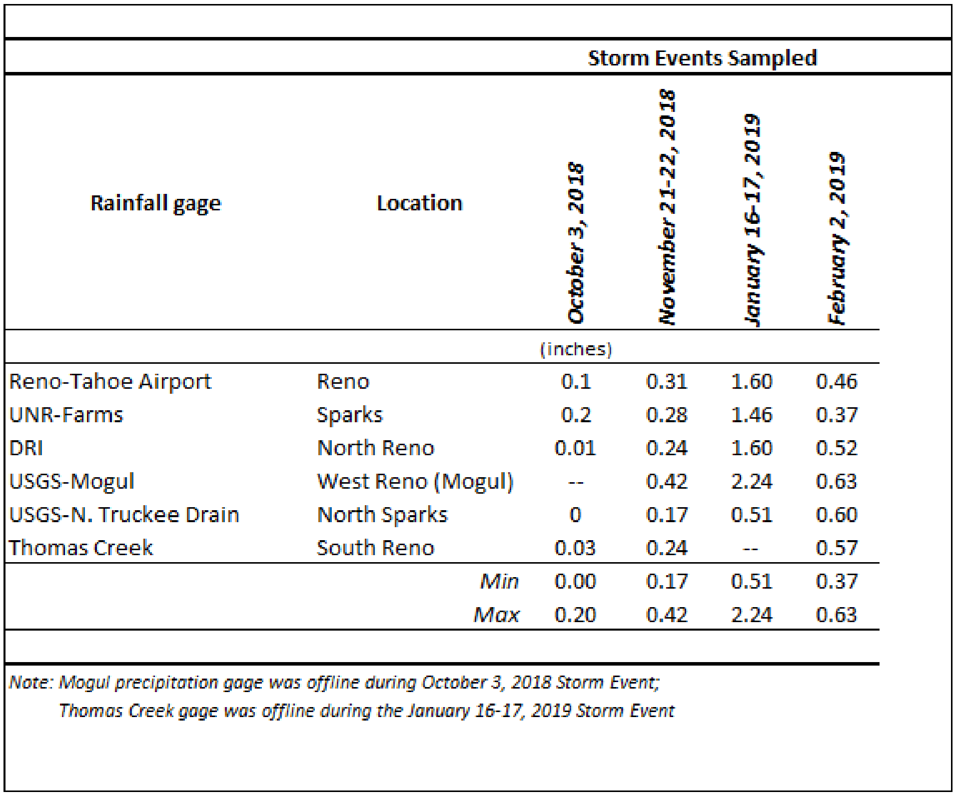


Figure 5-1 **Cumulative Precipitation at 6 Different Rain Gages, Truckee Meadows, Nevada, FY2019**

Precipitation occurrence, depths and durations varied widely across the area. The 4 events that were sampled are highlighted as well as the dates when baseflow was sampled.

Table 5-2 Summary of Precipitation Depths for 6 Stations over Sampled Storm Events, Truckee Meadows, FY2019



		Storm Events Sampled			
Rainfall gage	**Location**	***October 3, 2018***	***November 21-22, 2018***	***January 16-17, 2019***	***February 2, 2019***
		(inches)			
Reno-Tahoe Airport	Reno	0.1	0.31	1.60	0.46
UNR-Farms	Sparks	0.2	0.28	1.46	0.37
DRI	North Reno	0.01	0.24	1.60	0.52
USGS-Mogul	West Reno (Mogul)	--	0.42	2.24	0.63
USGS-N. Truckee Drain	North Sparks	0	0.17	0.51	0.60
Thomas Creek	South Reno	0.03	0.24	--	0.57
	Min	0.00	0.17	0.51	0.37
	Max	0.20	0.42	2.24	0.63

Note: Mogul precipitation gage was offline during October 3, 2018 Storm Event;
Thomas Creek gage was offline during the January 16-17, 2019 Storm Event

5.3 FY2019 Hydrologic Response

Annual hydrographs for 8 tributaries to the Truckee River monitored in FY2019 are presented in this section along with descriptions of hydrologic response to storms according to near-continuous streamflow records from gaging stations operated and maintained by Balance Hydrologics, TMWA, NDOT and USGS. We show daily mean streamflow for the Truckee River and near-continuous streamflow (5- or 15-minute data) for all monitored tributaries. The higher resolution 5-minute data are required at some stations to illustrate the urban nature of storm event runoff in these tributaries where instantaneous streamflow can exceed the daily mean streamflow by an order of magnitude.

5.3.1 TRUCKEE RIVER HYDROLOGIC RESPONSE, FY2019

Figure 5-2 shows FY2019 daily mean streamflow for the Truckee River at three different USGS gaging stations within the Truckee Meadows: Truckee River at Mogul, Truckee River at Reno, and Truckee River at Vista, in FY2019. These gaging stations were selected because they bracket the upstream and downstream extents of the Truckee Meadows where tributaries and outfalls sampled under this program discharge to the Truckee River.

Storms sampled during FY19 affected the Truckee River flow to varying degrees (Figure 5-2). At the beginning of the fiscal year (July 1, 2018), during baseflow conditions, daily streamflow was 391 cfs (Mogul), 376 cfs (Reno), and 435 cfs (Vista). An October 3, 2018 event was sampled, representing a very isolated convective storm and the first precipitation since July 2018. Also, a moderate frontal storm on November 21-22, 2019 was sampled; however, these two events marginally increased daily streamflow in the Truckee River. A significant frontal storm on January 16-17, 2019 increased daily streamflow to 891 cfs at Reno and 1596 cfs at Vista gaging stations. A stormwater peak of 2,261 cfs was recorded at the Reno gage on February 14, 2019. Snowmelt runoff began in late February 2019, with Truckee River streamflow increasing to close to 2000 cfs. Daily mean streamflow rose above 2000 cfs in March 2019. An annual peak flow of 5100 cfs was recorded at Vista on April 9, 2019. Flows began to recede on June 20, 2019 and continued to recede through the end of the fiscal year.

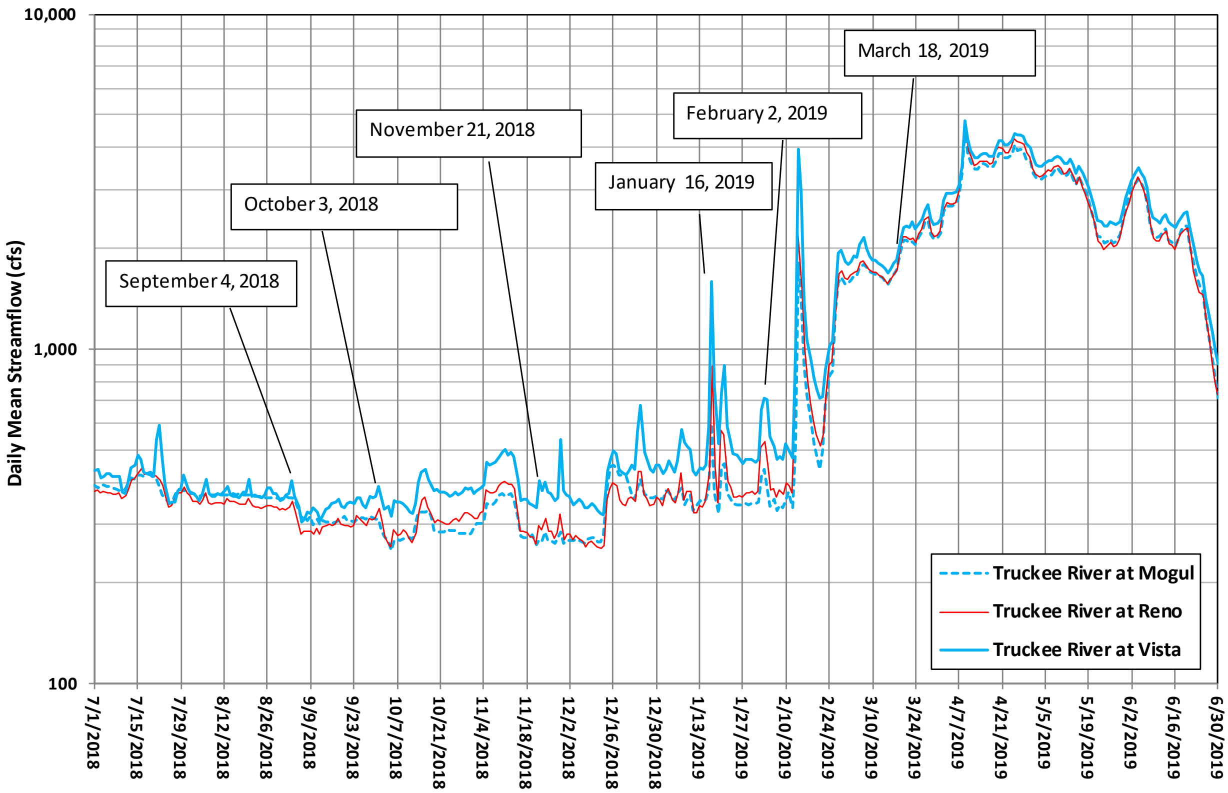


Figure 5-2 **Daily Mean Streamflow, Truckee River at Three Stations, Truckee Meadows, Nevada, FY2019** As the Truckee River flows through the Cities of Reno and Sparks, it receives contributing flows from North Truckee Drain, Steamboat Creek and several other smaller tributaries and stormwater urban outfalls. Hydrologic response in the Truckee River to four sampled storms and two ambient baseflow samples in FY2019 are identified (USGS Stations 10347460, 10348000 and 10350000).

5.3.2 NORTH TRUCKEE DRAIN HYDROLOGIC RESPONSE, FY2019

Figure 5-3 displays a record of near-continuous (15-minute) streamflow in the North Truckee Drain (NTD) at two monitoring stations, Orr Ditch (NTD@ORD) and Big Fish Drive (NTD@BFD) in FY2019. At the beginning of the fiscal year, baseflow in the North Truckee Drain was measured to be near 4 cfs at NTD@ORD and approximately 2.6 cfs downstream at NTD@BFD. Streamflow records at both stations exhibited rapid rising and falling limbs of the hydrograph during storm events, reflecting the high degree of imperviousness in the watershed. Sampled storms in January and February 2019 reached peak flows of 311 cfs and 58 cfs, respectively, at Big Fish Drive, and 90 cfs and 29 cfs, respectively, at Orr Ditch. The annual peak flow on North Truckee Drain occurred on February 14, 2019 and was measured at 615 cfs at Big Fish Drive and 366 cfs at Orr Ditch.

Baseflow was sampled from both stations on September 4-5, 2018 and March 18-19, 2019 to characterize the summer and winter ambient water quality, respectively.

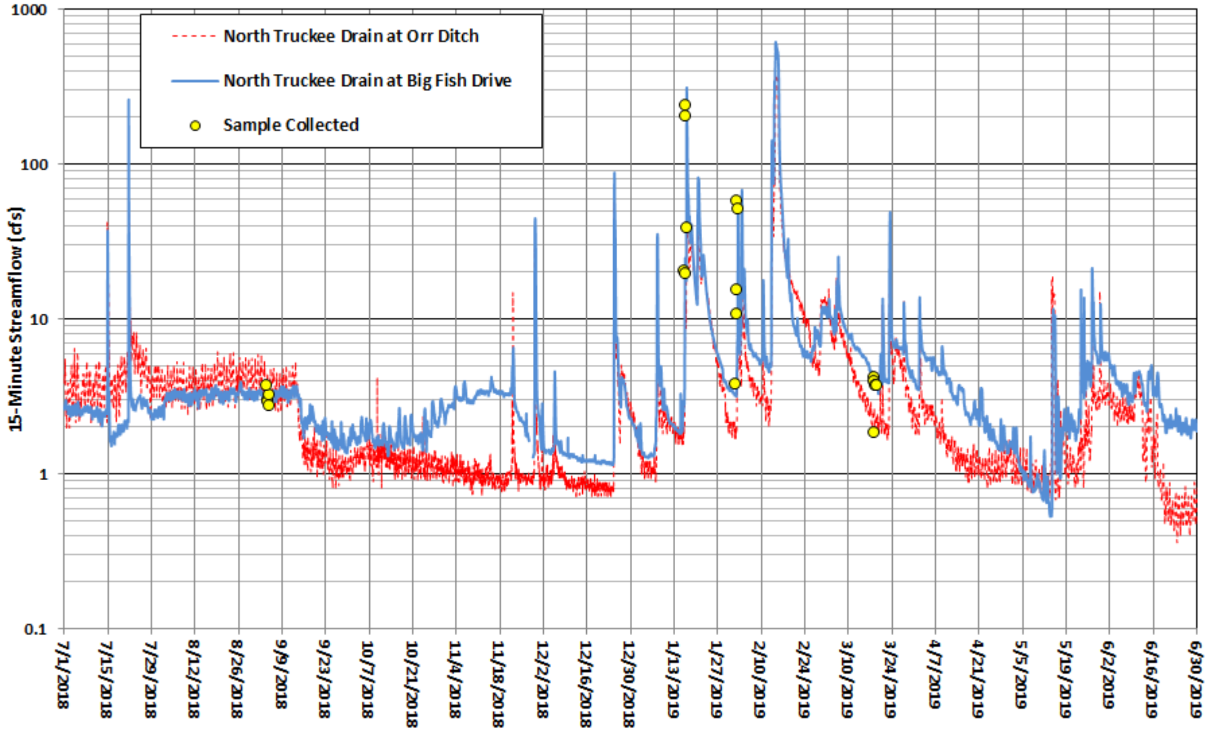


Figure 5-3 **Continuous (15-minute) Streamflow, North Truckee Drain at Orr Ditch and Big Fish Drive, Truckee Meadows, Nevada, FY2019 (USGS Stations 10348245 and 10348295)**

5.3.3 STEAMBOAT CREEK HYDROLOGIC RESPONSE, FY2019

FY2019 continuous streamflow for three monitoring stations on Steamboat Creek at Rhodes Road (SBC@RR), the Narrows (SBC@NAR), and Clean Water Way (SBC@CWW) are shown in **Figure 5-4**. Baseflow conditions existed at the beginning of the FY2019 (July 1, 2018) thru November with streamflow ranging from 1 cfs to 10 cfs (SBC@RR), 5 cfs to 20 cfs (SBC@NAR), and 25 cfs to 45 cfs (SBC@CWW). Sampled storms occurred on January 16-17, 2019 and February 2, 2019. Peak flows from the sampled storms measured at SBC@CWW were 682 cfs in January and 170 cfs in February. The annual peak flow of 1750 cfs was recorded at SBC@CWW on February 14, 2019. SBC@CWW became backwatered by high flows on the Truckee River between April 1 and April 22, 2019 and again from May 30 thru June 8, 2019 so streamflow data are not available for these periods. Streamflow continued to rise through most of June 2019 due to snowmelt runoff and reached peak flows of 212 cfs at SBC@CWW, 172 cfs at SBC@NAR and 109 cfs at SBC@RR. Flows began to recede around June 20 but still remained high at the end of FY2019. Baseflow was sampled from all three stations on September 4-7, 2018 and March 18-19, 2019 to characterize the summer and winter ambient water quality, respectively.

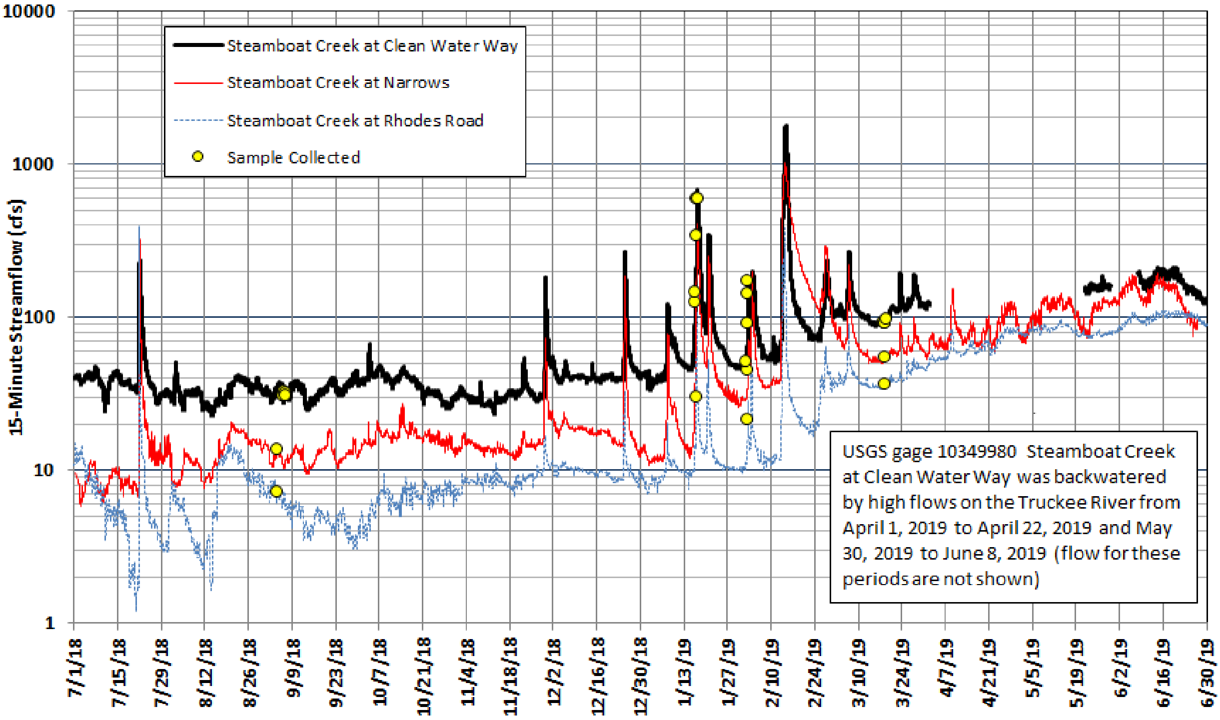


Figure 5-4 Continuous (15-minute) Streamflow, Steamboat Creek at Three Stations, Truckee Meadows, Nevada, FY2019

5.3.4 ALUM CREEK HYDROLOGIC RESPONSE, FY2019

Figure 5-5 shows 15-minute continuous streamflow for Alum Creek at Mayberry Drive in FY2019. Manual measurements of streamflow and the collection dates of water quality samples (collected at AC@TR) are also shown. The gaging station was moved upstream in August 2018 from the original location (AC@TR) due to channel degradation and restoration activity that effected streamflow at the gaging site. Samples are still collected at the original location for continuity. The gage had to be moved a second time in 2018 due to channel manipulation near the gage pool and was not online at its current location near Mayberry Drive until October 25, 2018. Streamflow exceeding 16 cfs is based on an extrapolation of the stage-discharge rating curve as estimated using high-water marks and hydraulic geometry.

The hydrograph for Alum Creek exhibited flashy peak flows with rapid rise and fall of stage, indicative of an urbanized watershed. Recorded baseflow at Alum Creek was between 0.05 and 0.20 cfs when the gage was relocated in October 2018. An estimated annual peak flow of 41 cfs occurred on February 14, 2019. Stormwater samples were collected on January 17 and February 2, 2019. Peak flows associated with the sampled storms measured 19 cfs and 13 cfs respectively. Streamflow associated with snowmelt runoff measured between 2.5 cfs and 5.7 cfs through April and May. Snow melt recession began at the beginning of June and continued through the end of FY2019.

Baseflow water quality samples to characterize ambient conditions were collected on September 5, 2018 and March 19, 2019.

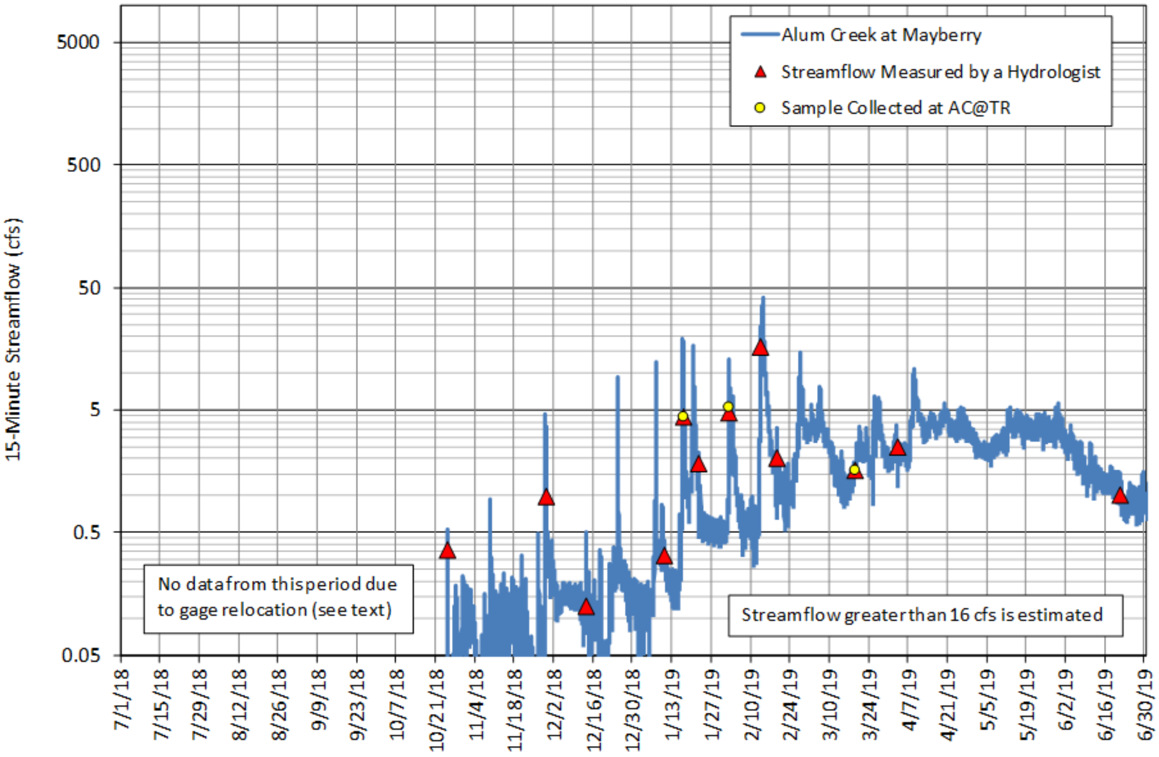


Figure 5-5 Continuous (15-minute) Streamflow, Alum Creek at Mayberry Drive, FY2019

5.3.5 CHALK CREEK HYDROLOGIC RESPONSE, FY2019

Figure 5-6 shows 15-minute continuous streamflow for Chalk Creek at Chalk Bluff in FY2019. Manual measurements of streamflow and collection of water quality samples are also shown. Streamflow exceeding 30 cfs is based on an extrapolation of the stage-discharge rating curve as estimated using high-water marks and hydraulic geometry.

Chalk Creek exhibited perennial streamflow flashy peak flows with rapid rise and fall in streamflow, indicative of an urbanized watershed. Daily mean baseflow was between roughly 0.6 and 1.0 cfs in summer and fall of 2018, and between 1 and 1.5 cfs in Spring 2019. Storm events increased streamflow on multiple occasions in FY2019 beginning in November 2018 with estimated peak flows between 13 and 50 cfs. The annual peak flow was estimated to be roughly 50 cfs on January 17, 2019 and a stormwater sample was also collected on that day. A second stormwater sample was collected on February 2, 2019, peak flow on that day was estimated at 32 cfs. Baseflow water quality samples to characterize ambient conditions were collected on September 5, 2018, and March 19, 2019.

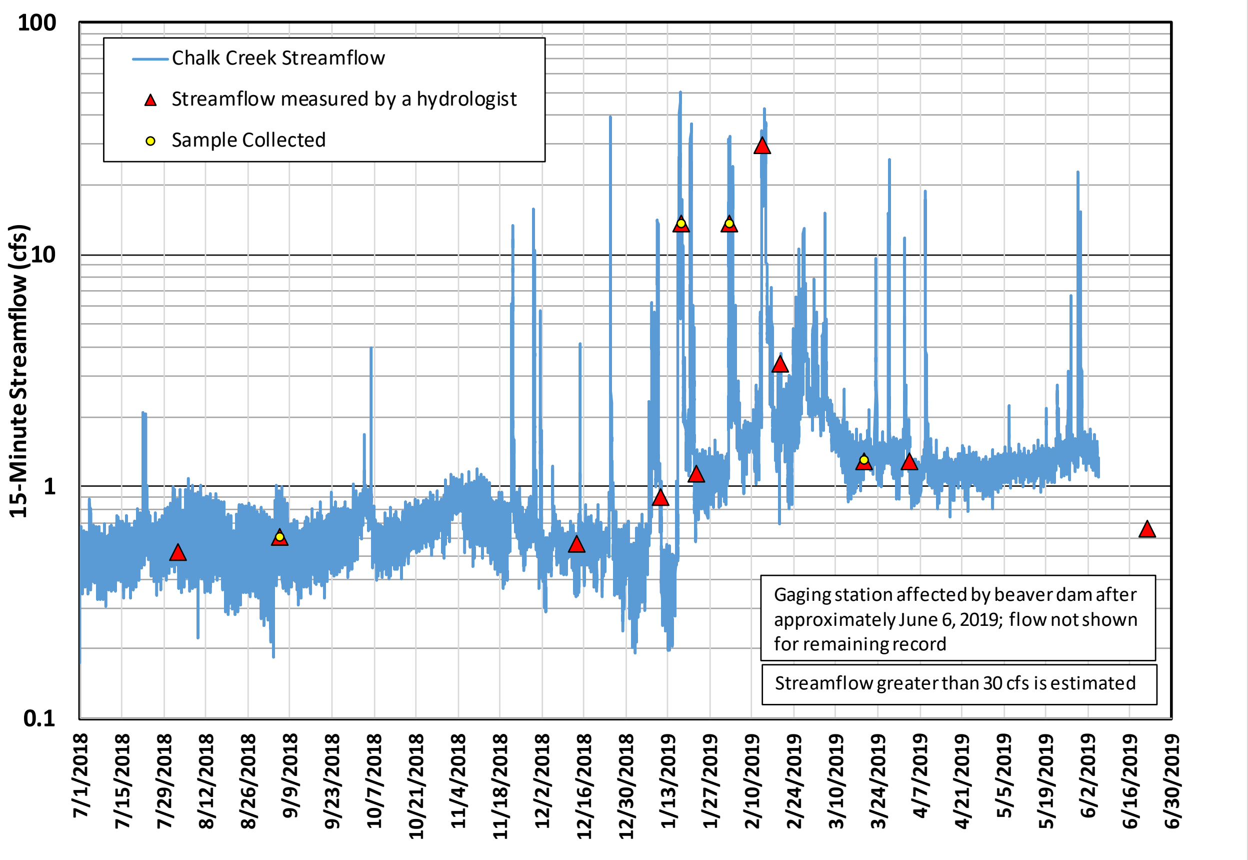


Figure 5-6 Continuous Streamflow (15-minute), Chalk Creek at Chalk Bluff, FY2019

5.3.6 THOMAS CREEK HYDROLOGIC RESPONSE, FY2019

Figure 5-7 shows 15-minute continuous streamflow for Thomas Creek at South Meadows Parkway in FY2019. Manual measurements of streamflow and collection of water quality samples are also shown. Thomas Creek originates above 8,000 feet and receives snowmelt runoff from Mount Rose, urban runoff from the lower watershed, and irrigation return flows from Last Chance Ditch. As such, we observed daily fluctuations in streamflow associated with a diurnal snowmelt cycle and flashy peak flows (rapid rise and fall of stage), indicative of urban stormwater runoff.

Thomas Creek exhibited perennial streamflow in FY2019. Baseflow in the beginning of the fiscal year continued to reflect a snowmelt recession with daily flow around 1 cfs but falling to near 0.2 cfs by the beginning of August 2018. Fluctuations in streamflow, absent of precipitation, are likely associated with irrigation return flows. An early fall thunderstorm was sampled on October 3, 2018 and was the first precipitation since July. Storm events caused streamflow to increase on multiple occasions in FY2019 with an annual peak flow of 45 cfs recorded on January 17, 2019. A storm sample was also collected on that day.

Another peak flow of 43 cfs occurred on February 2, 2019. Snowmelt runoff increased daily flows to near 10 cfs in April 2019 and continued through the rest of the fiscal year. Baseflow water quality samples for ambient conditions were collected on September 5, 2018, and March 19, 2019.

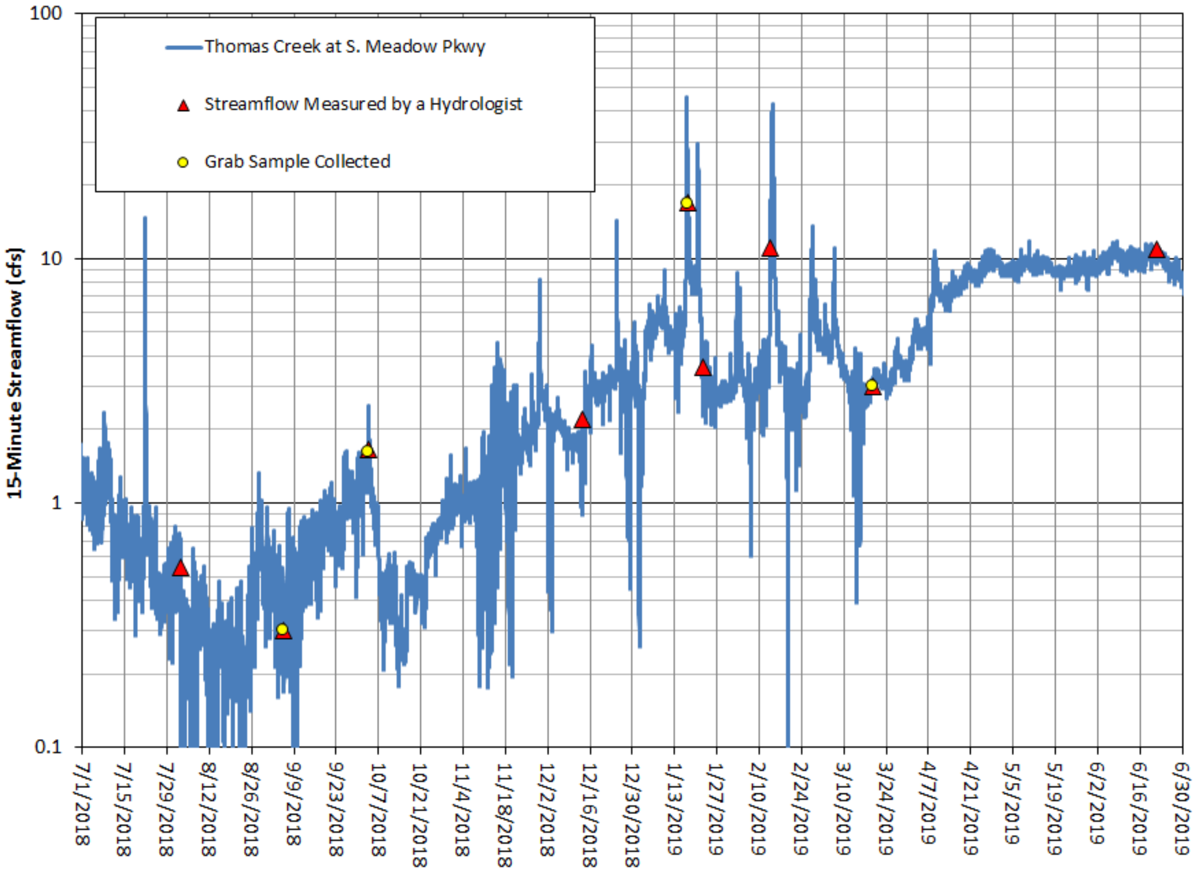
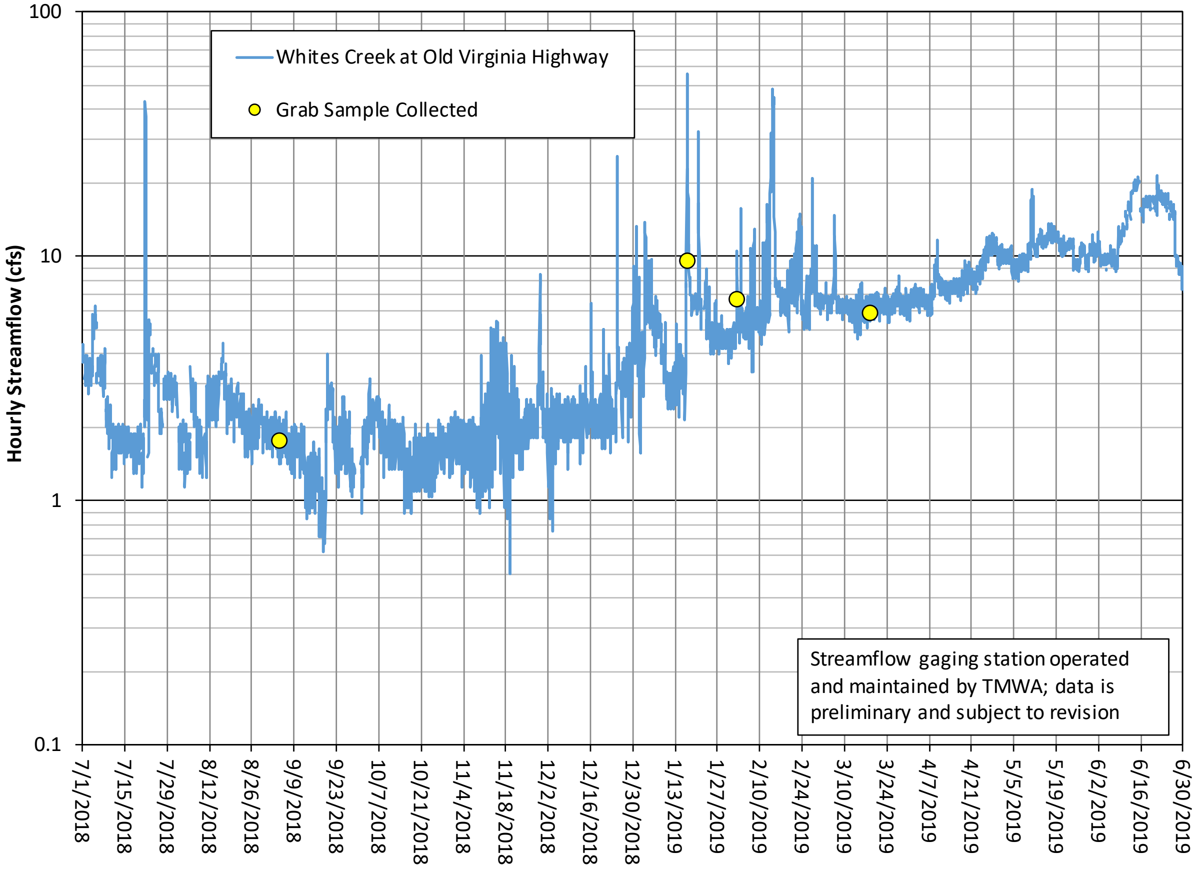


Figure 5-7 **Continuous Streamflow (15-minute), Thomas Creek at S. Meadows Parkway, FY2019**

5.3.7 WHITES CREEK HYDROLOGIC RESPONSE, FY2019

Figure 5-8 shows hourly streamflow on Whites Creek at Old Virginia Highway and collection of water quality samples. This gaging station is operated and maintained by TMWA; accuracy of streamflow was not verified. Whites Creek exhibited perennial streamflow in FY2019. Baseflow in the beginning of the fiscal year measured between 1 cfs and 2 cfs and rose above 2 cfs in November. An annual peak flow of 56 cfs was recorded on January 17, 2019, though maximum capacity of the flume is approximately 45 cfs (Steeland, K., pers. comm., 2018) and thus this measurement could be inaccurate. A storm sample was collected earlier in the day on January 17, 2019. A second storm water sample was collected on February 2, 2019 with peak flows recorded at 10 cfs on that day. Additional storms exhibited streamflow response over February 2019. Higher ambient streamflow, above 5 cfs from snowmelt runoff, continued through the rest of FY2019.

Baseflow water quality samples were collected on September 4, 2018 and March 18, 2019.



Streamflow gaging station operated and maintained by TMWA; data is preliminary and subject to revision

Figure 5-8 Continuous Streamflow (hourly), Whites Creek at Old Virginia Highway, FY2019. (Data provided by TMWA, preliminary and subject to revision).

5.3.8 Yori Drain Hydrologic Response, FY2019

Figure 5-9 shows discharge events for Yori Drain, a tributary to Steamboat Creek, during FY2019. Near-continuous data is reported in 15-minute intervals. This station experienced equipment failures in FY2019; therefore, we present a partial period of record in FY2019. The hydrology in Yori Drain includes diversions from Pioneer Ditch, and therefore changes in streamflow may not be dependent on precipitation. As a result, creating a rain to runoff relationship is not applicable at this station, making flow-weighted sampling difficult. Instead, sampling at this station is time-based and near-continuous discharge is recorded during the sampling period.

Yori Drain exhibits perennial flow, with baseflow ranging between 2 cfs and 5 cfs. The outfall (and instrument) experiences backwatering by Steamboat Creek when Steamboat Creek flow at Clean Water Way (USGS 10349980) is greater than 300 cfs. Temporarily moving the auto sampler upstream during backwater conditions allowed for stormwater sampling. Equipment failure from August to November 2018 prevented the recording of hydrologic data, after which time a back-up stage recorder was installed. Using previous gaging data with mathematical comparison, a stage to discharge ratio was created to estimate streamflow for the remainder of the fiscal year.

Stormwater quality samples were collected during the November 21-22, 2018, January 16-17, 2019 and February 2, 2019 storm events. Loads for the November 2018 storm were calculated but backwatering during the January storm and equipment malfunction during the February storm prevented flow data from being available, only concentrations are presented in this report for those storms. Baseflow samples were collected on September 4-5, 2018 and on March 18-19, 2019 using the automated sampler.

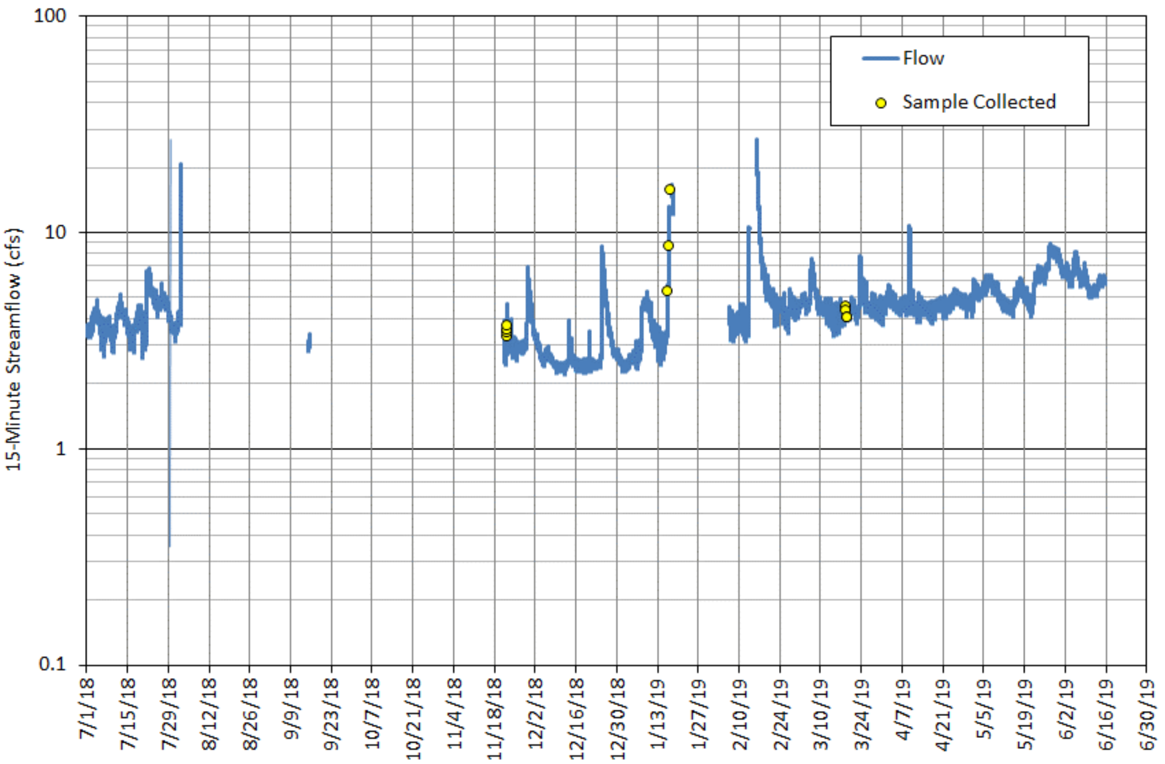


Figure 5-9 **Continuous Streamflow (15-minute), Yori Drain at Steamboat Creek, FY2019**

5.3.9 ARLINGTON (H-19) STORMWATER URBAN OUTFALL HYDROLOGIC RESPONSE, FY2019

Figure 5-10 shows discharge events for the stormwater urban outfall located at Arlington Street (H-19) in FY2019. Near-continuous data is reported in 5-minute intervals due to the flashy nature of runoff in this steep, highly urbanized stormwater outfall. This station exhibits short lived runoff during precipitation events and is typically dry during non-storm periods. We did however measure runoff during non-storm periods, which may be the result of residential irrigation runoff, illegal discharges, or urban nuisance flow. Such runoff events were recorded daily through much of October 2018 with no specific characterization determined as sources.

In FY2019 multiple peak flows exceeded 10 cfs, with the annual peak flow of roughly 13 cfs on January 17, 2019. Stormwater quality samples were collected on November 21-22, 2018 and January 16-17, 2019. Stormwater urban outfalls were not sampled for baseflow conditions.

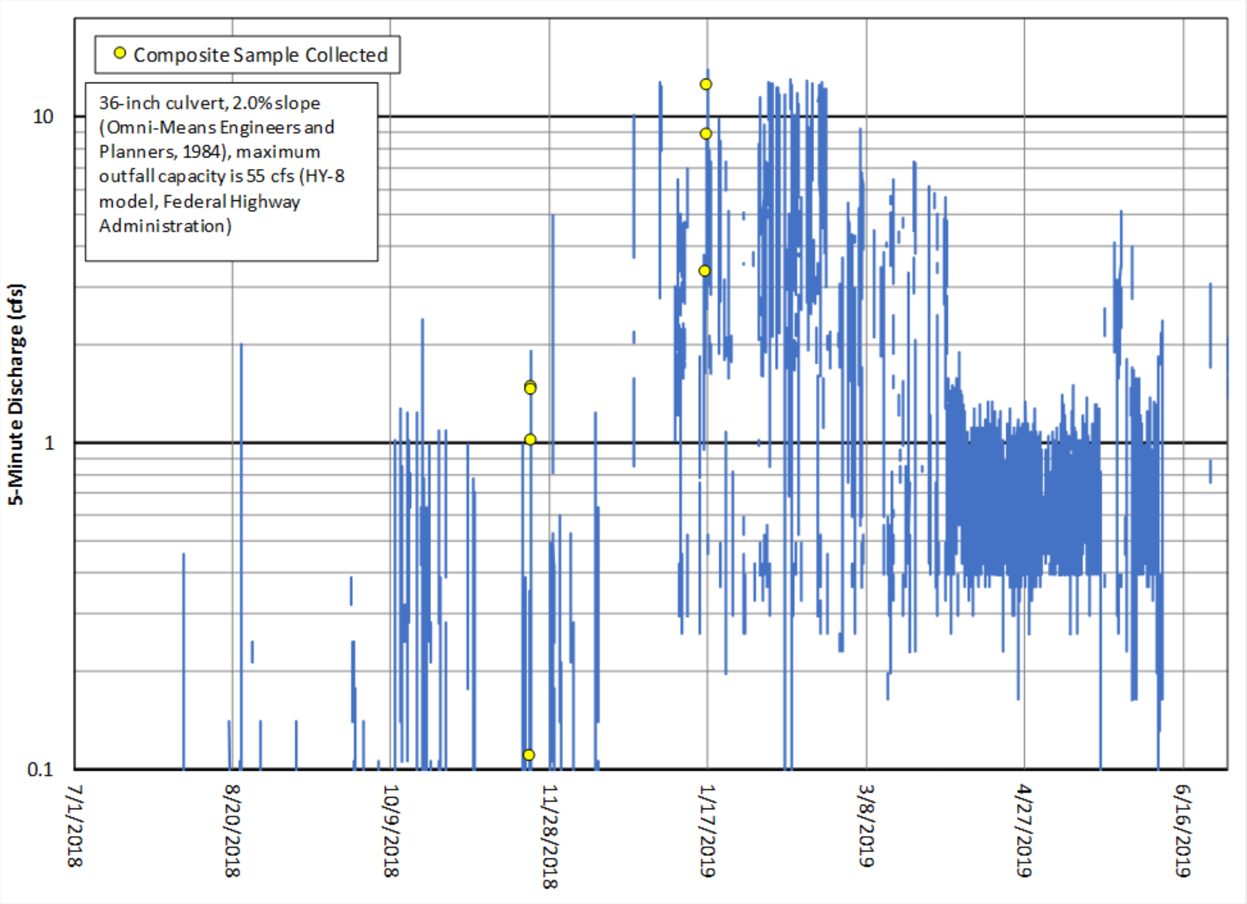


Figure 5-10 Continuous Discharge (5-minute), Arlington outfall (H-19), FY2019

5.4 Storm event and Baseflow Constituent Concentrations and Physical Parameters

The established water quality standards (WQS) and requirements to maintain higher quality differ from one monitoring location to another, as described in Section 1.3. Below we present results for both storm event and ambient water quality results for each sample collected and each constituent analyzed in FY2019. In some cases, no water quality standards are established for a given waterway location, but the water quality of the reach in question must be protective of downstream receiving waters per the Tributary Rule (NAC 445A.1239). All samples that the laboratory reported as non-detect are not shown in graphs.

Decreases in water quality are expected in high runoff events and the purpose of this project is to sample at least two storms that meet the qualifications for sampling as set out in the 2018 SAP, meeting the requirements for the MS4 permit. Concentration values that exceed WQS do not necessarily reflect overall waterbody annual water quality.

5.4.1 Total Nitrogen, Nitrate, Nitrite, and Total Kjeldahl Nitrogen

Total Nitrogen (Total-N) concentrations for all samples collected in FY2019 are shown in **Figure 5-11**, **Figure 5-12**, **Figure 5-13**, **Figure 5-14**, and **Figure 5-15**, grouped by their listed water body and specific WQS or numeric criteria, if one exists. Stations that are instrumented with automated samplers may show 4 different concentrations per storm event and baseflow sampling to correspond to the composited samples across a storm hydrograph. All other stations will show a single concentration per grab sample or per storm event and baseflow sampling.

Total-N was detected in most samples collected from two tributaries and one stormwater urban outfall (Oxbow Nature Park) that discharge to the Truckee River upstream of Idlewild (**Figure 5-11**). Total-N concentrations ranged from 0.32 mg/L to 23.0 mg/L. All storm samples collected in FY2019 exceeded the WQS for this segment of the Truckee River above Idlewild Park (≤ 0.43 mg/L, NAC 445a. 1684). Ambient or baseflow samples collected from Chalk Creek in September 2018 and March 2019 also exceeded WQS and ranged between 1.7 mg/L and 2.5 mg/L. However, Alum Creek baseflow sampled in September 2018 was non-detect for Total-N, and the baseflow sampled in March 2019 had a Total-N concentration of 0.32 mg/L, less than the WQS.

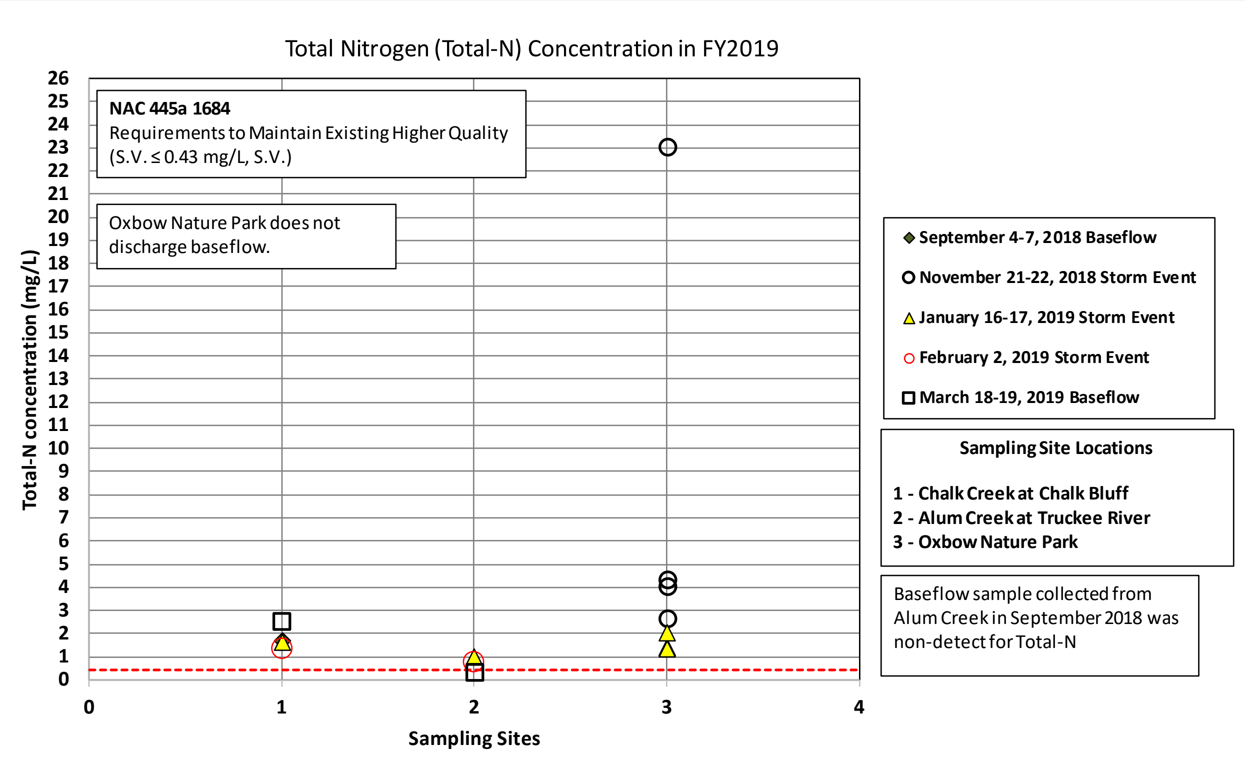


Figure 5-11 Total Nitrogen (Total-N) Concentrations for Tributaries and Stormwater Urban Outfalls to the Truckee River upstream of Idlewild, FY2019

Total-N was detected in all storm event samples collected from three stormwater urban outfalls that discharge to the Truckee River between E. McCarran and Idlewild (see **Figure 5-12**). Concentrations exceeded the WQS for this segment of the Truckee River (≤ 0.43 mg/L) and ranged from 1.4 mg/L to as high as 19.0 mg/L. Stormwater urban outfalls do not typically exhibit baseflow and were therefore not sampled during ambient or non-storm conditions.

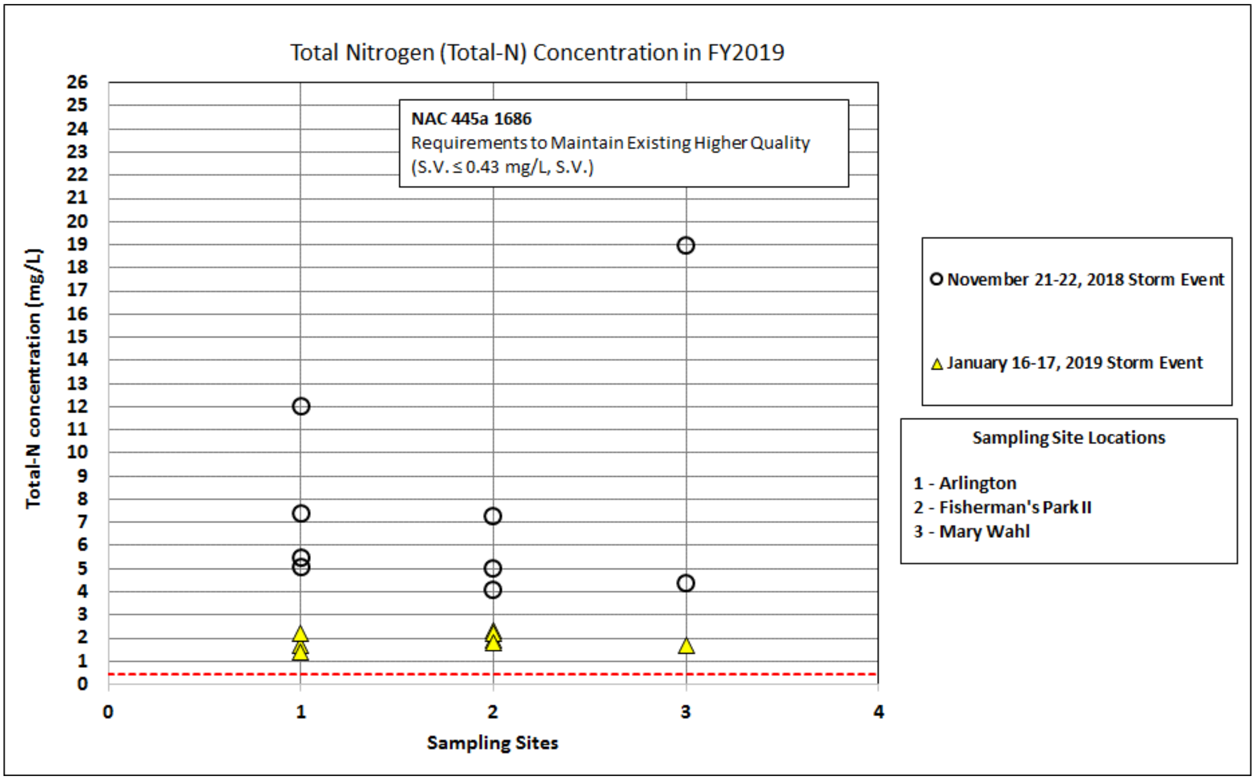


Figure 5-12 Total Nitrogen (Total-N) Concentrations for a Stormwater Urban Outfall to the Truckee River from E. McCarran upstream to Idlewild, FY2019

Total-N was detected in all samples collected from the North Truckee Drain, a tributary to the Truckee River upstream of Lockwood, as shown in **Figure 5-13**. All samples exceeded the WQS for this segment of the Truckee River (≤ 1.2 mg/L) and ranged from 1.5 mg/L to 3.9 mg/L. Ambient concentrations from March 2019 exceeded storm event concentrations at both North Truckee Drain sites.

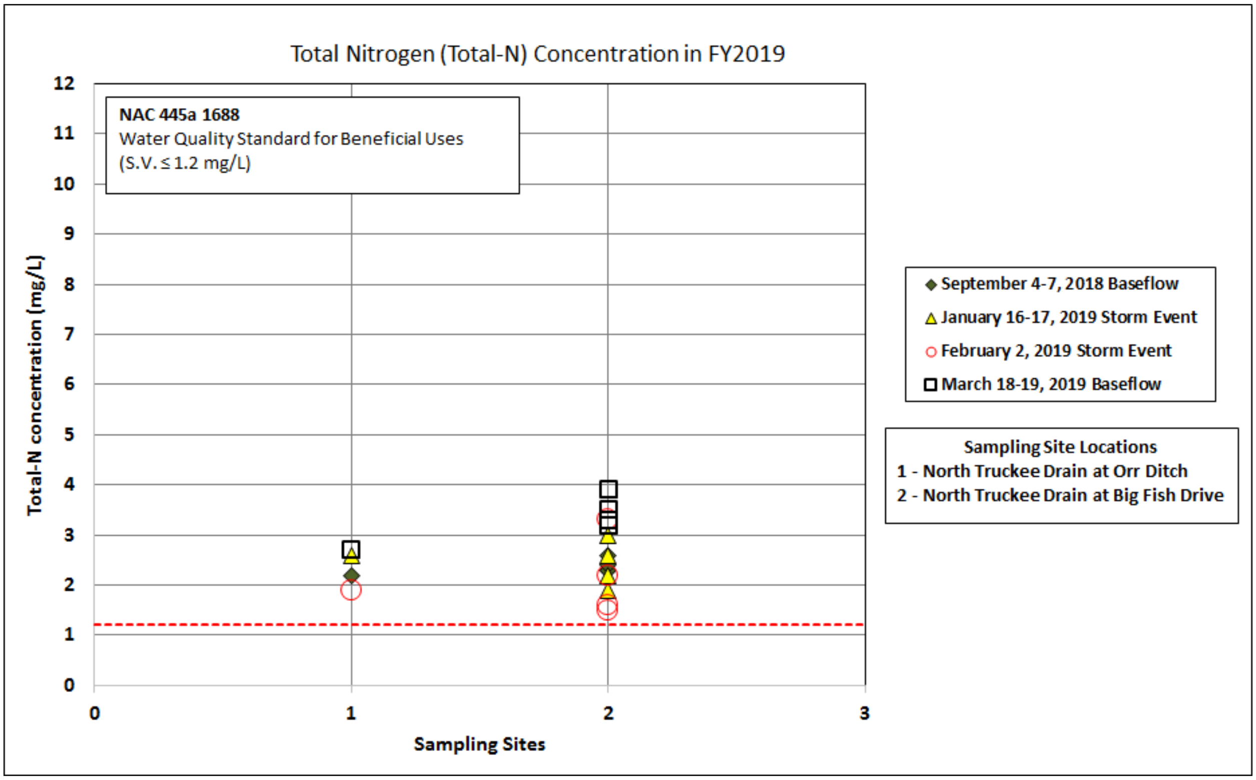


Figure 5-13 Total Nitrogen (Total-N) Concentrations for the North Truckee Drain, FY2019

Total-N concentrations from samples collected in Steamboat Creek and Thomas Creek (a tributary to Steamboat Creek) ranged from 0.75 mg/L to 3.8 mg/L, as shown in **Figure 5-14**. The highest concentration was measured in Yori Drain at Steamboat Creek during the January 16-17, 2019 storm event. Summer baseflow concentrations exhibited lower values when compared to storm event concentrations in Yori Drain and Boynton Slough. Winter baseflow concentrations were similar to storm event samples. Total-N was not detected in Thomas Creek at South Meadows Parkway during baseflow conditions. The summer baseflow sample from Steamboat Creek at Rhodes Road had a higher Total-N concentration than the winter baseflow sample, whereas the summer and winter baseflow samples at the downstream monitoring locations on Steamboat Creek (SBC@NAR and SBC@CWW) had similar Total-N concentrations. There are no Total-N WQS for Steamboat Creek, and by the Tributary Rule, WQS for the Truckee River at Lockwood (< 1.2 mg/L) apply to Steamboat Creek (NAC 445A.1239).

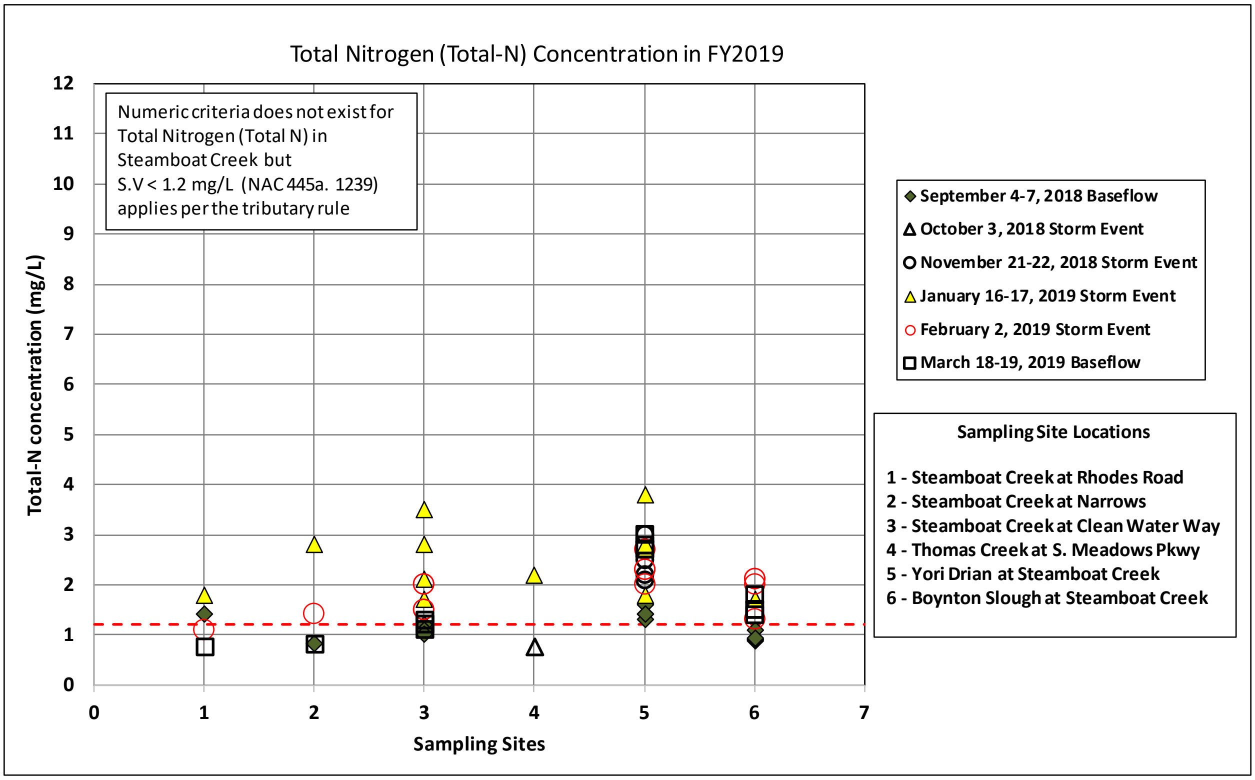


Figure 5-14 Total Nitrogen (Total-N) Concentrations for Steamboat Creek and Tributaries, FY2019

Total-N concentrations from two storm event samples collected in Whites Creek measured 0.36 mg/L and 1.3 mg/L (**Figure 5-15**). Samples collected from summer baseflow measured 0.23 mg/L and winter baseflow were non-detect for Total-N. There are no Total-N WQS for Whites Creek.

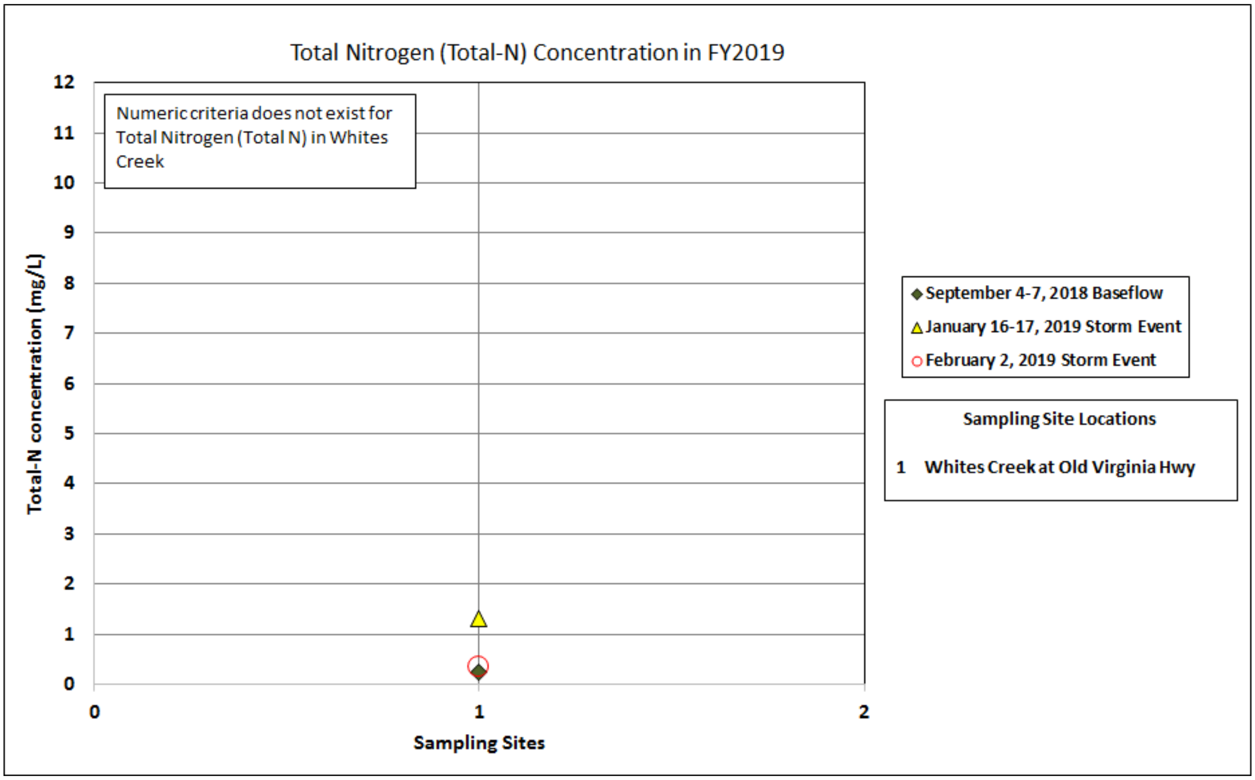


Figure 5-15 Total Nitrogen (Total-N) Concentrations for Whites Creek, FY2019

Nitrate (NO_3) is measured only at selected stations (as per the 2018 SAP). NO_3 concentrations for storm event and ambient samples collected in FY2019 are shown in **Figure 5-16**, **Figure 5-17**, **Figure 5-18**, **Figure 5-19** and **Figure 5-20,** grouped by their listed water body and specific numeric criteria. Due to timing of storms and related laboratory holding times for Nitrate testing, a majority of samples were processed using an alternative assay. EPA 353.2, Determination of Nitrate-Nitrite Nitrogen by Automated Colorimetry, the Lachat Method, is an EPA approved and equivalent method, in which results of nitrite and nitrate are combined (mg N (as $NO_3 + NO_2$)/L). Nitrite concentrations, when detected, are typically low or below laboratory reporting limits.

NO_3 measured from two tributaries and one stormwater urban outfall that discharge to the Truckee River upstream of Idlewild ranged from 0.06 mg/L to as high as 2.6 mg/L (**Figure 5-16**). One composite sample from Oxbow park exceeded the WQS for this segment of the Truckee River (≤ 2.0 mg/L), but all other samples were below the WQS.

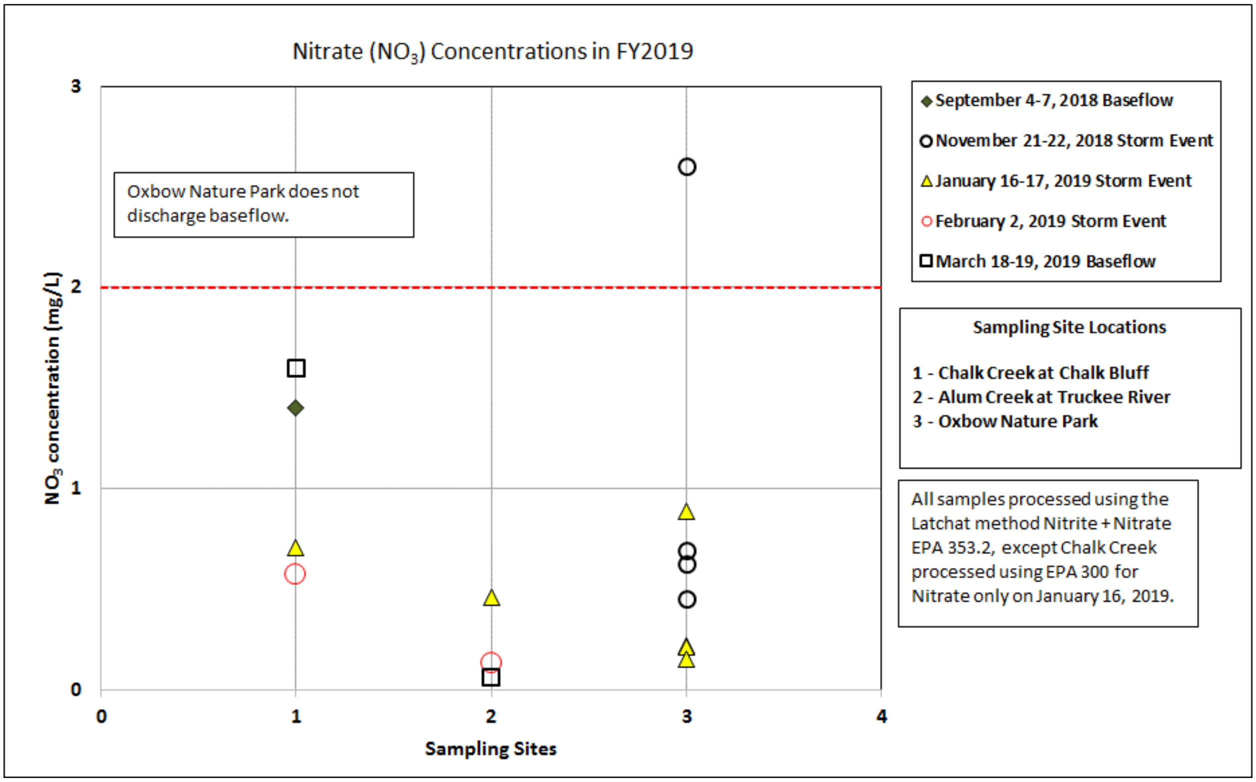


Figure 5-16 Nitrate Concentrations for Tributaries and a Stormwater Urban Outfall to the Truckee River Upstream of Idlewild, FY2019

NO_3 concentrations measured from samples collected at three stormwater urban outfalls that discharge to the Truckee River between E. McCarran and Idlewild, ranged between 0.1 mg/L and 2.3 mg/L (**Figure 5-17**). One sample collected from Mary Wahl during the November 21-22, 2018 storm exceeded the WQS established for this segment with a NO_3 concentration of 2.3 mg/L. Stormwater urban outfalls do not typically convey baseflow and were therefore not sampled during ambient or non-storm conditions.

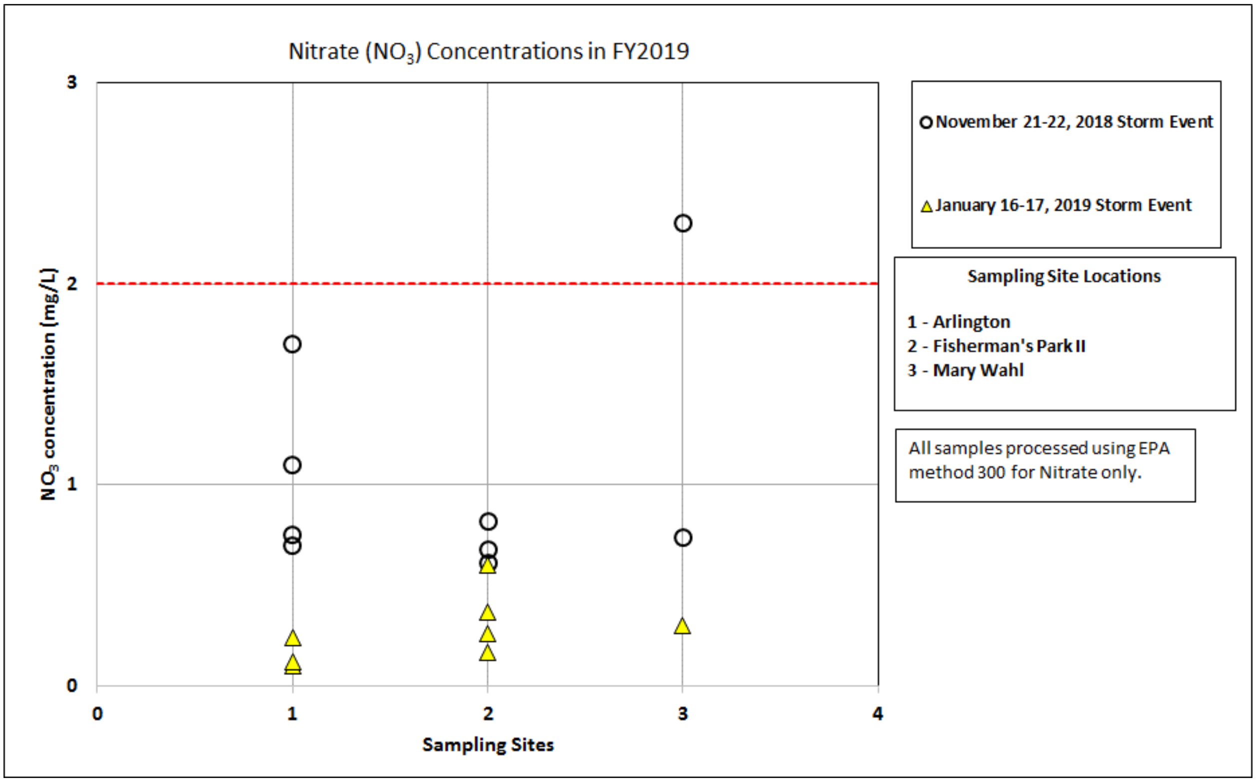


Figure 5-17 Nitrate Concentrations for Stormwater Urban Outfalls to the Truckee River from E. McCarran upstream to Idlewild, FY2019

NO_3 concentrations measured from samples collected in North Truckee Drain, a tributary to the Truckee River upstream of Lockwood, ranged between 0.29 mg/L and 2.3 mg/L (**Figure 5-18**). One baseflow and one storm sample collected at the Big Fish Drive station exceeded the WQS established for this segment (≤ 2.0 mg/L) with NO_3 concentrations of 2.1 mg/L during March baseflow and 2.3 mg/L during the February storm event Both baseflow sample concentrations (September and March) exceeded storm concentrations at Orr Ditch.

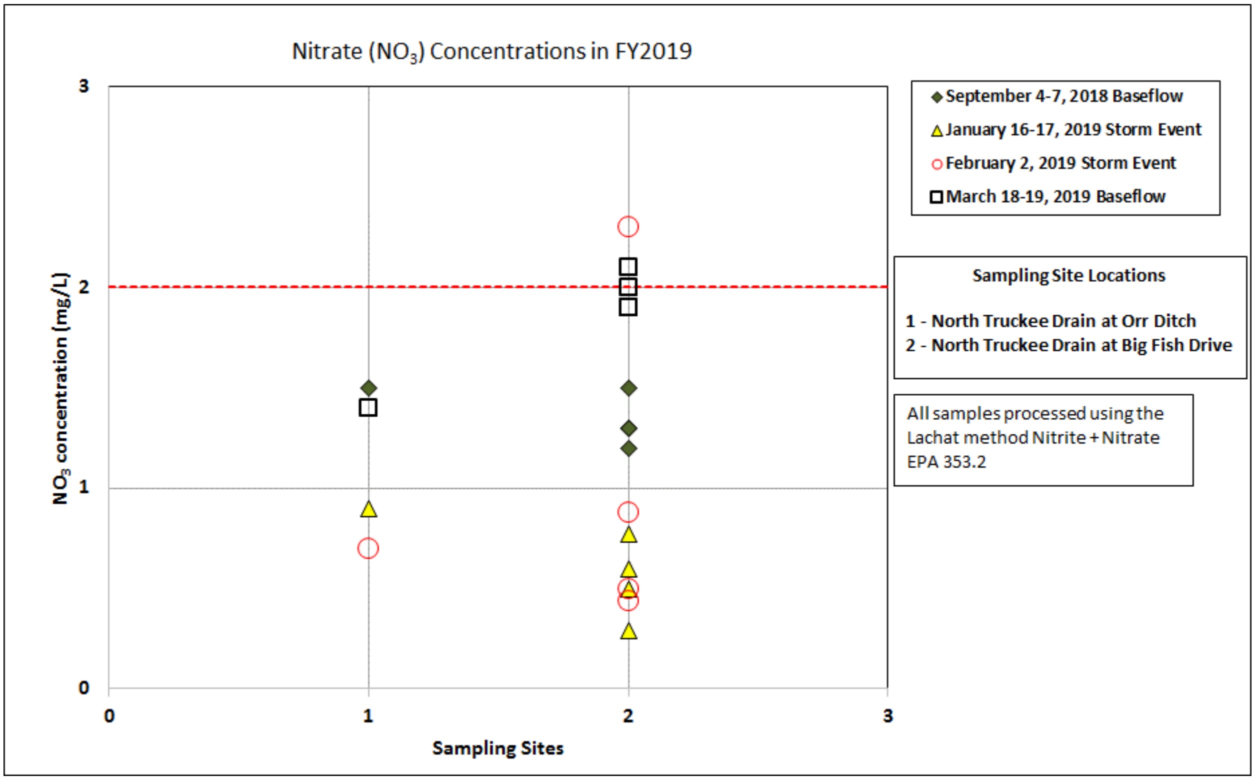


Figure 5-18 Nitrate Concentrations for the North Truckee Drain, FY2019

NO_3 concentrations measured from samples collected at three different stations in Steamboat Creek ranged from less than 0.03 mg/L to 2.2 mg/L (**Figure 5-19**). The highest concentrations were measured in Yori Drain during storm events and winter baseflow. NO_3 was not detected in baseflow samples collected from Thomas Creek. No nitrate numeric criteria exist for Steamboat Creek, but the tributary rule does apply.

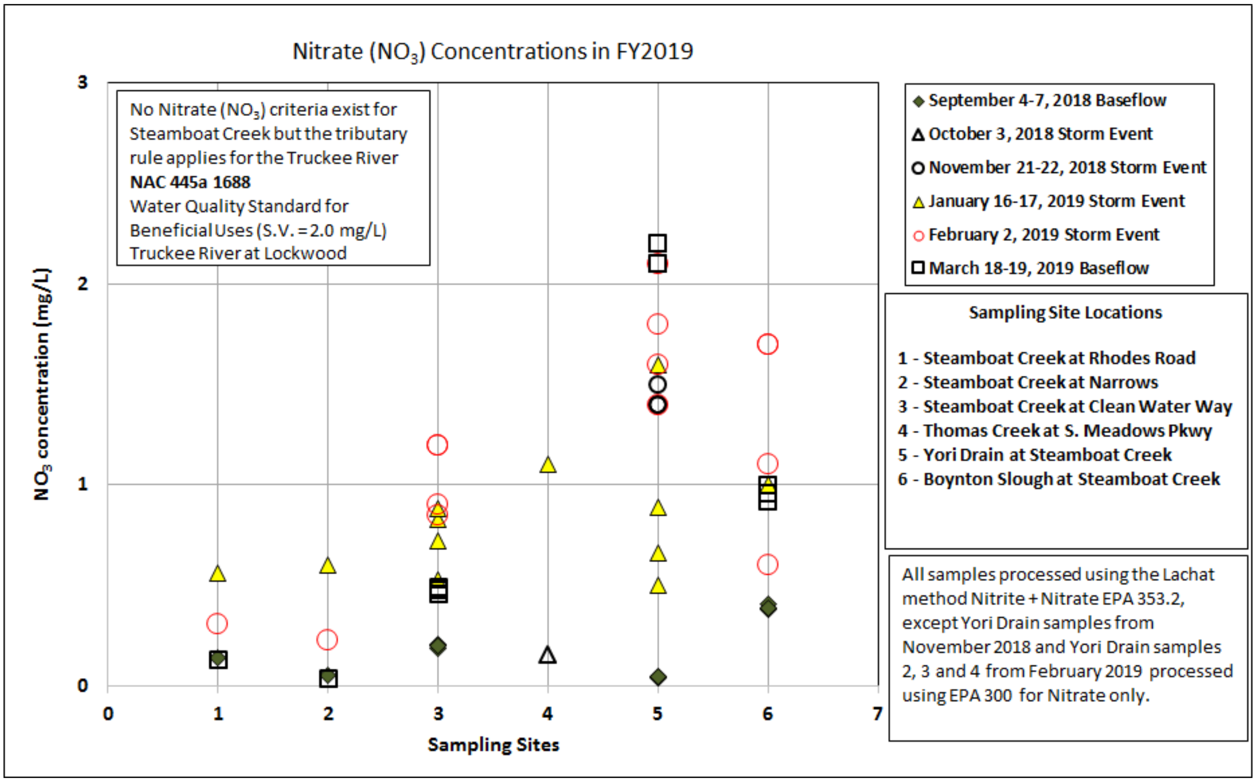


Figure 5-19 Nitrate Concentrations for Steamboat Creek, FY2019

NO_3 was detected in Whites Creek samples at concentrations ranging from 0.04 mg/L to 0.49 mg/L (**Figure 5-20**). The sample with the lowest concentration was collected during summer baseflow and NO_3 was not detected in winter baseflow samples.

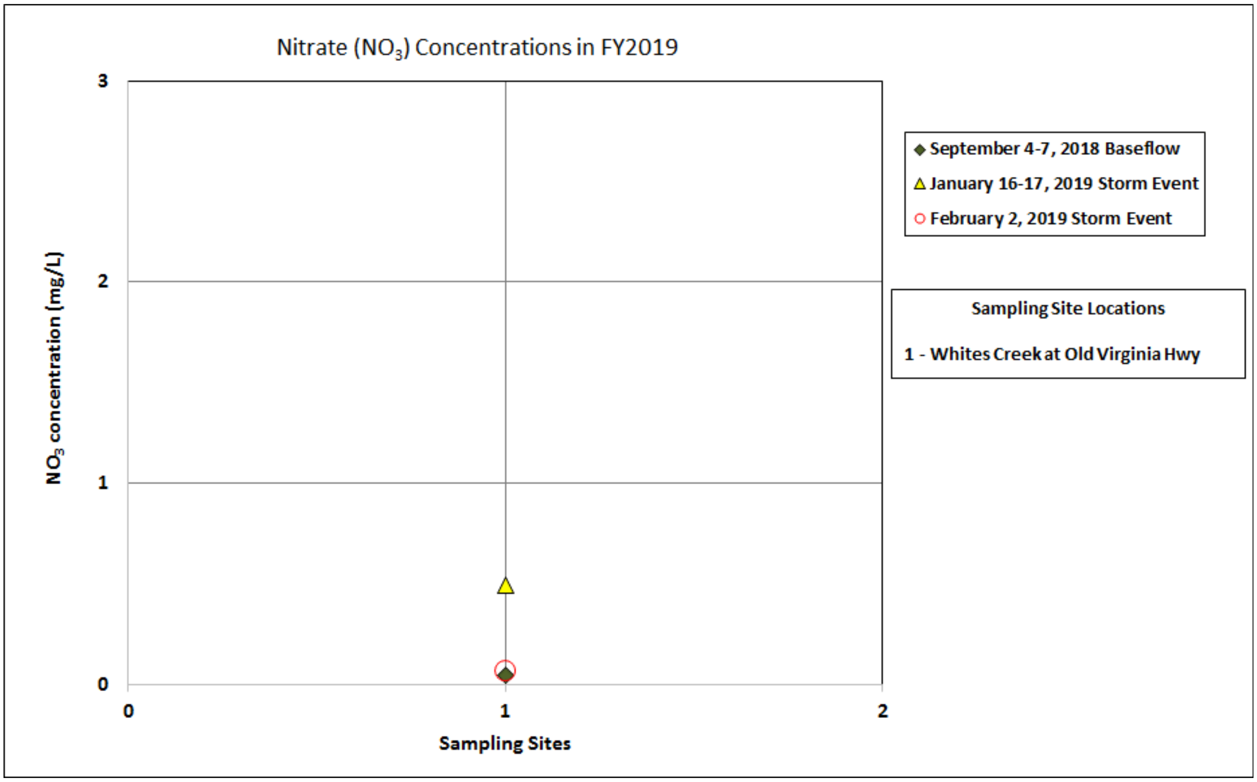


Figure 5-20 Nitrate Concentrations for Whites Creek, FY2019

Total Kjeldahl Nitrogen (TKN) includes both organically bound nitrogen and NH_3, forms available to aquatic life. TKN concentrations in storm events and ambient samples collected in FY2019 are shown in **Figure 5-21**, **Figure 5-22**, **Figure 5-23**, **Figure 5-24**, and **Figure 5-25**, grouped by their listed water body. Numeric criteria do not exist for TKN in the listed water bodies monitored under this program.

TKN concentrations measured from two tributaries and one stormwater urban outfall that discharge to the Truckee River upstream of Idlewild ranged from 0.26 mg/L to as high as 3.6 mg/L (**Figure 5-21**). The highest concentrations were associated with the November 21-22, 2018 storm event composite sample from Oxbow Nature Park. TKN was not measured above laboratory detection limits in baseflow sampled in September 2018.

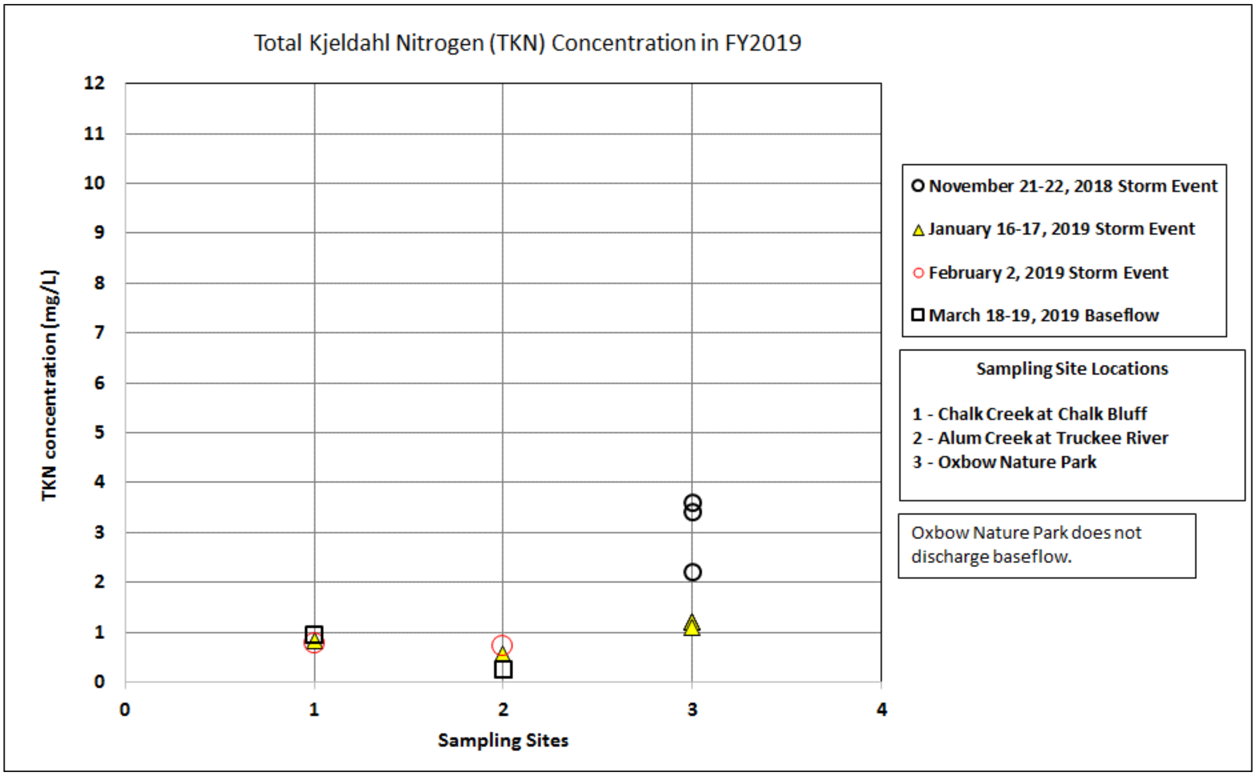
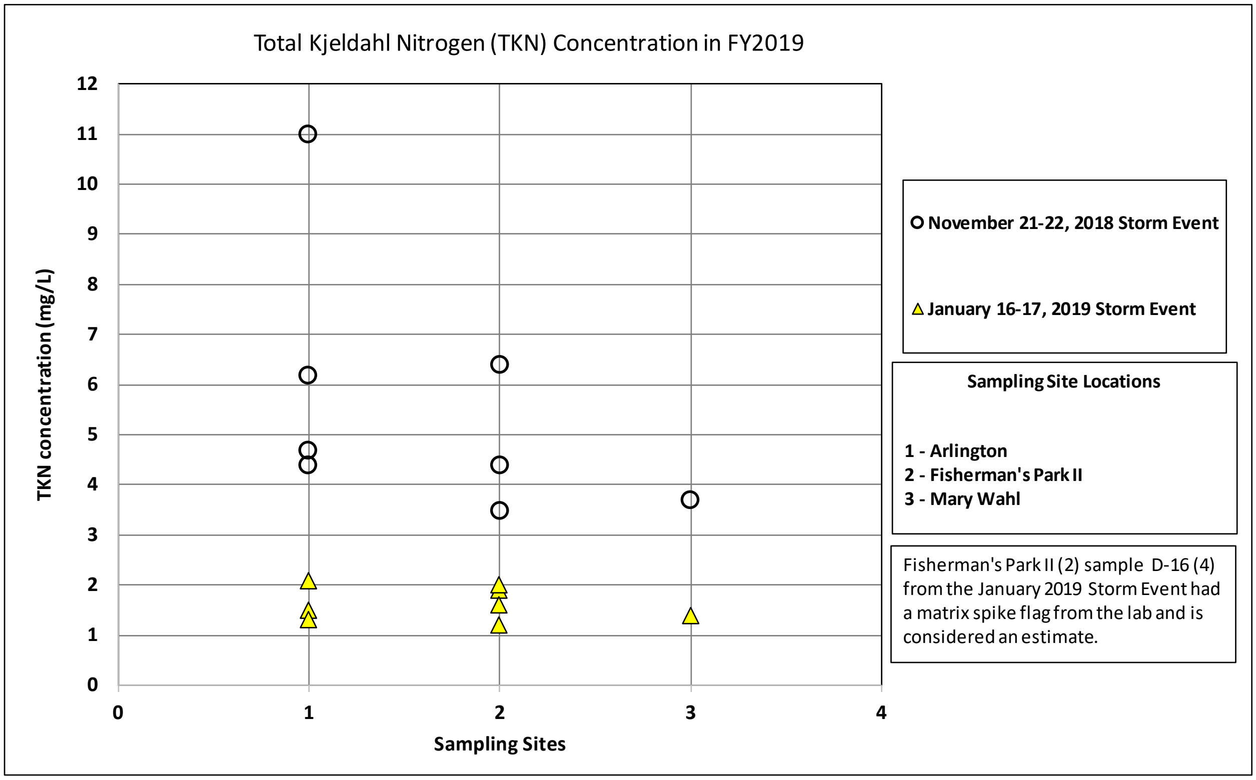


Figure 5-21 **TKN Concentrations for Tributaries and Stormwater Urban Outfalls to the Truckee River upstream of Idlewild, FY2019**

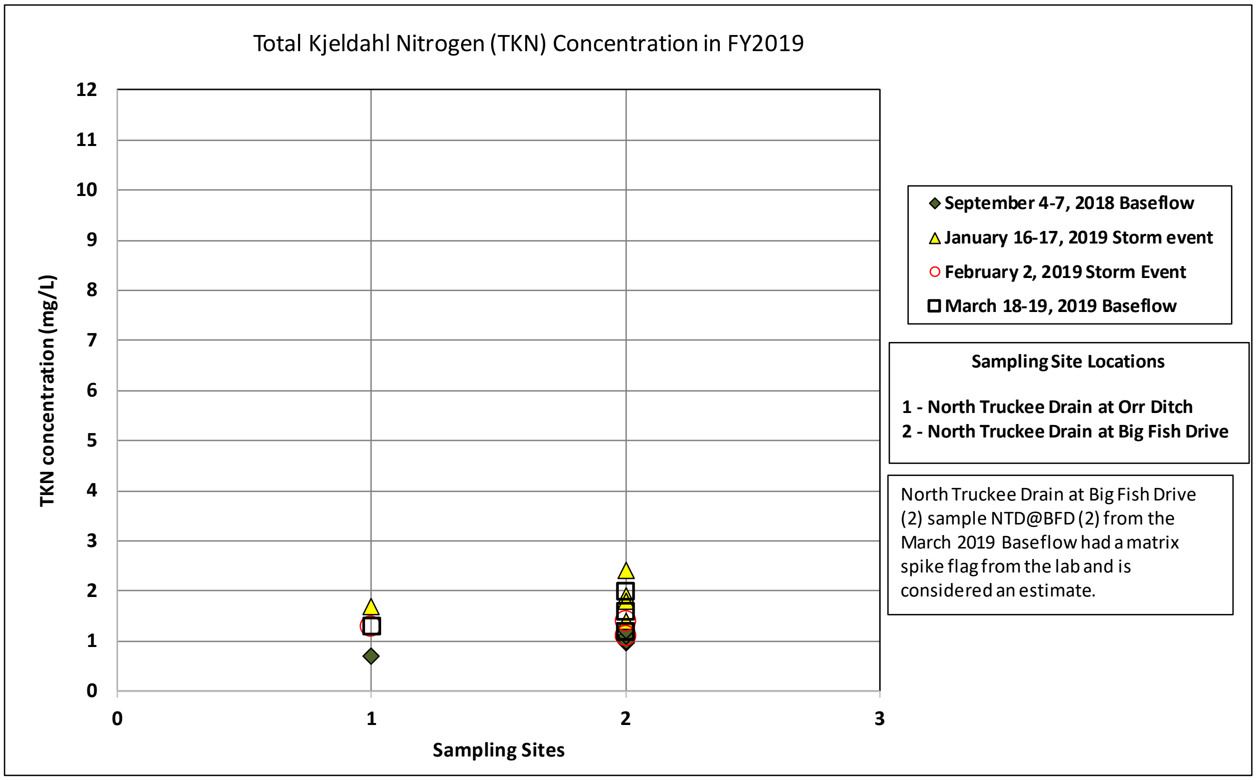
TKN concentrations measured from samples collected in three stormwater urban outfalls that discharge to the Truckee River between E. McCarran and Idlewild ranged between 1.2 mg/L and 11.0 mg/L (**Figure 5-22**). Highest concentrations were associated with stormwater collected on November 21-22, 2018 at the Arlington outfall. Stormwater outfalls do not typically convey baseflow and are not sampled during ambient or non-storm conditions.



Fisherman's Park II (2) sample D-16 (4) from the January 2019 Storm Event had a matrix spike flag from the lab and is considered an estimate.

Figure 5-22 TKN Concentrations for Stormwater Urban Outfalls to the Truckee River from E. McCarran upstream to Idlewild, FY2019

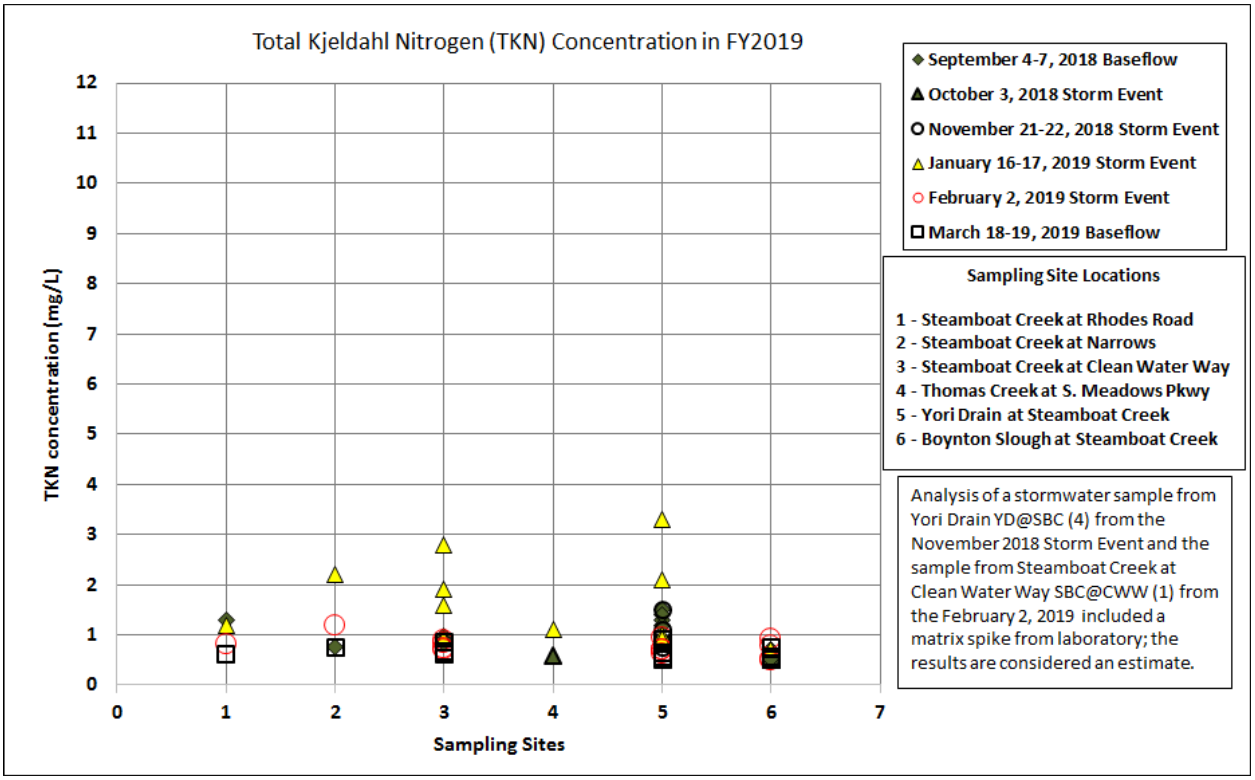
TKN concentrations measured from samples collected in the North Truckee Drain ranged between 0.70 mg/L and 2.4 mg/L (**Figure 5-23**). In most cases, the storm event concentrations and the winter baseflow concentrations were higher than summer baseflow concentrations.



North Truckee Drain at Big Fish Drive (2) sample NTD@BFD (2) from the March 2019 Baseflow had a matrix spike flag from the lab and is considered an estimate.

Figure 5-23 TKN Concentrations for the North Truckee Drain, FY2019

TKN concentrations measured from samples collected at three different stations in Steamboat Creek and tributaries below Rhodes Road ranged from 0.49 mg/L to 3.3 mg/L (**Figure 5-24**). The highest TKN concentrations were collected at Yori Drain and Clean Water Way during the January 2019 storm event.



Analysis of a stormwater sample from Yori Drain YD@SBC (4) from the November 2018 Storm Event and the sample from Steamboat Creek at Clean Water Way SBC@CWW (1) from the February 2, 2019 included a matrix spike from laboratory; the results are considered an estimate.

Figure 5-24 TKN Concentrations for Steamboat Creek and Tributaries, FY2019

TKN concentrations measured from storm event samples collected in Whites Creek ranged from 0.33 mg/L to 0.84 mg/L (**Figure 5-25**). TKN was not measured above laboratory detection limits in baseflow samples.

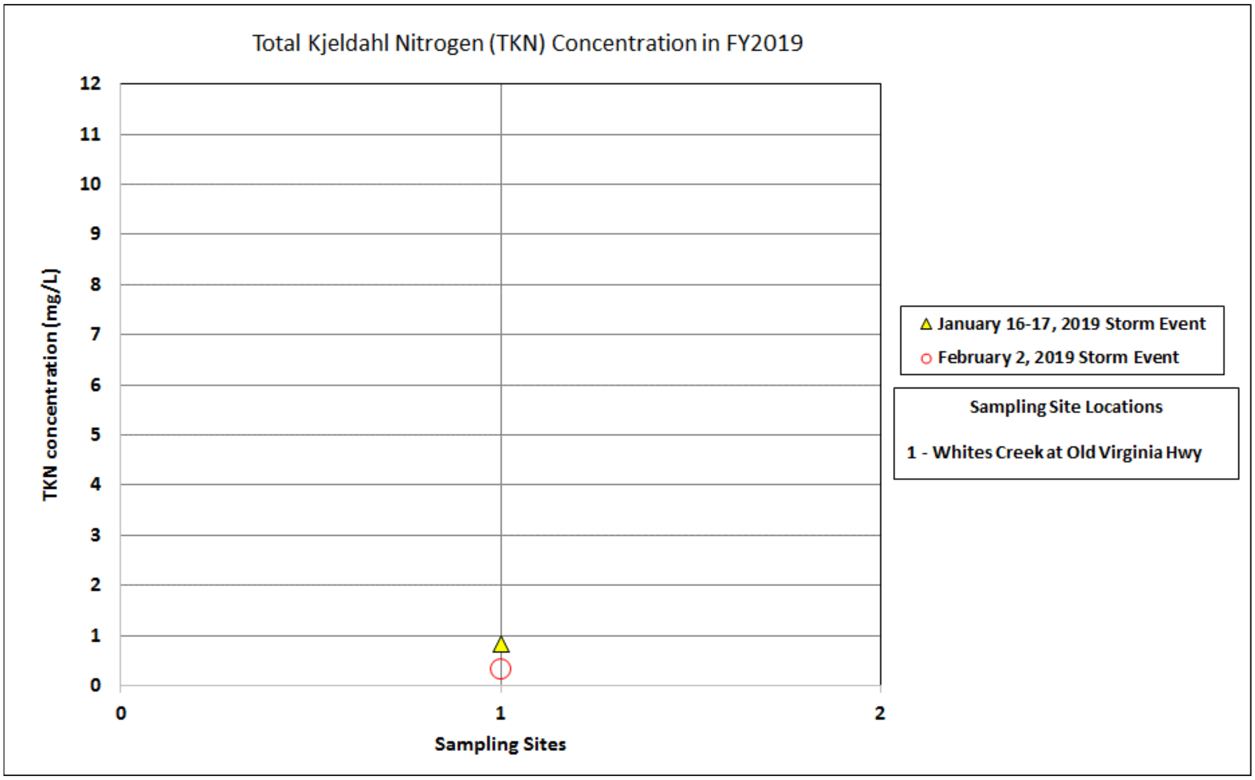


Figure 5-25 TKN Concentrations for Whites Creek, FY2019

5.4.2 TOTAL PHOSPHORUS AND ORTHO PHOSPHATE

Total-P concentrations for storm events and ambient samples collected in FY2019 are shown in **Figure 5-26**, **Figure 5-27**, **Figure 5-28**, **Figure 5-29**, **Figure 5-30** and **Figure 5-31**, grouped by their listed water body. Single value WQS do not exist for Total-P in most of the tributaries monitored. Where none exist, we compare concentrations to annual-averages to maintain existing higher quality (≤ 0.05 mg/L, NAC 445a. 1684, 1686, 1688, 1724, 1726 and 1758) and/or to protect beneficial uses (≤ 0.10 mg/L) in this reach. Although most samples exceeded these annual average standards, they are single values that may not represent long-term averages.

Total-P concentrations measured from two tributaries and one stormwater urban outfall that discharge to the Truckee River upstream of Idlewild ranged from 0.03 mg/L to 1.5 mg/L (**Figure 5-26**). Highest concentrations were measured in samples collected at Oxbow Nature park during the November 2018 storm event.

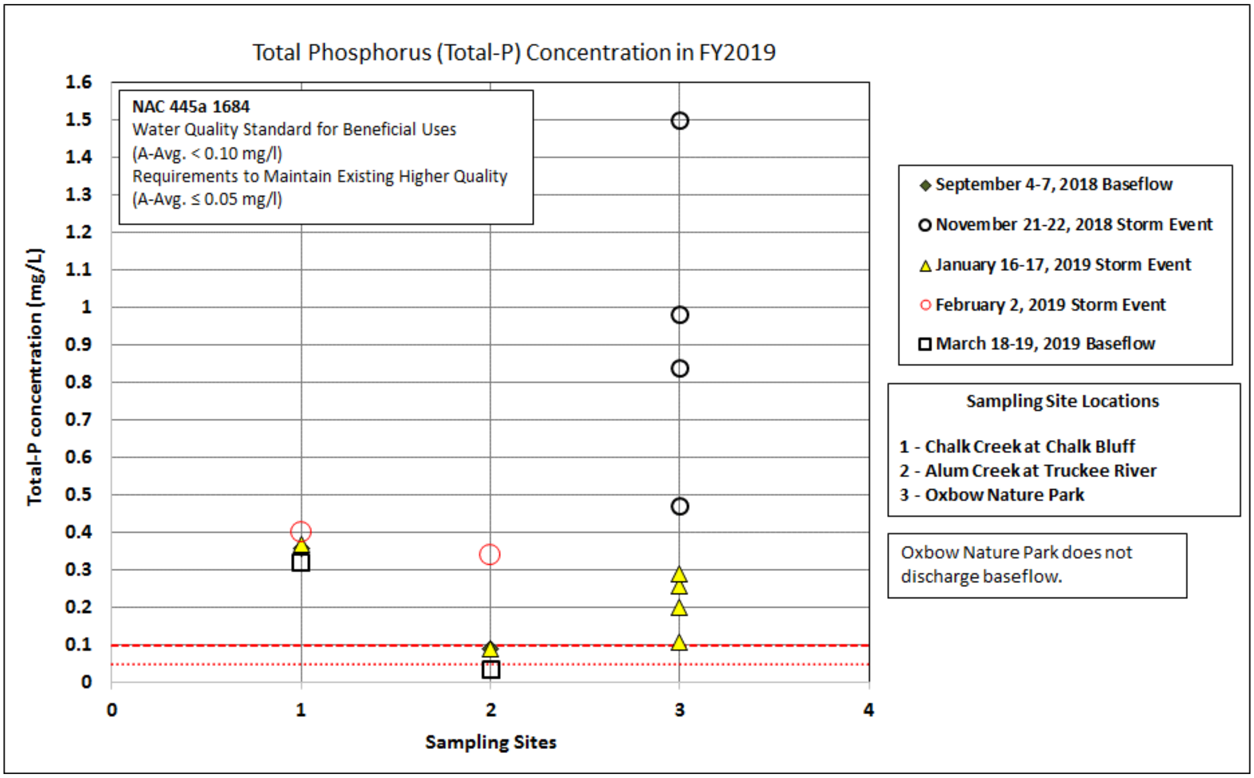


Figure 5-26 Total-P Concentrations for Tributaries and a Stormwater Urban Outfall to the Truckee River upstream of Idlewild, FY2019

Total-P concentrations measured from three stormwater urban outfalls that discharge to the Truckee River between E. McCarran and Idlewild ranged from 0.23 mg/L to as high as 4.7 mg/L (**Figure 5-27**). The highest concentration was measured from storm event samples collected from Arlington outfall during the November 2018 storm event.

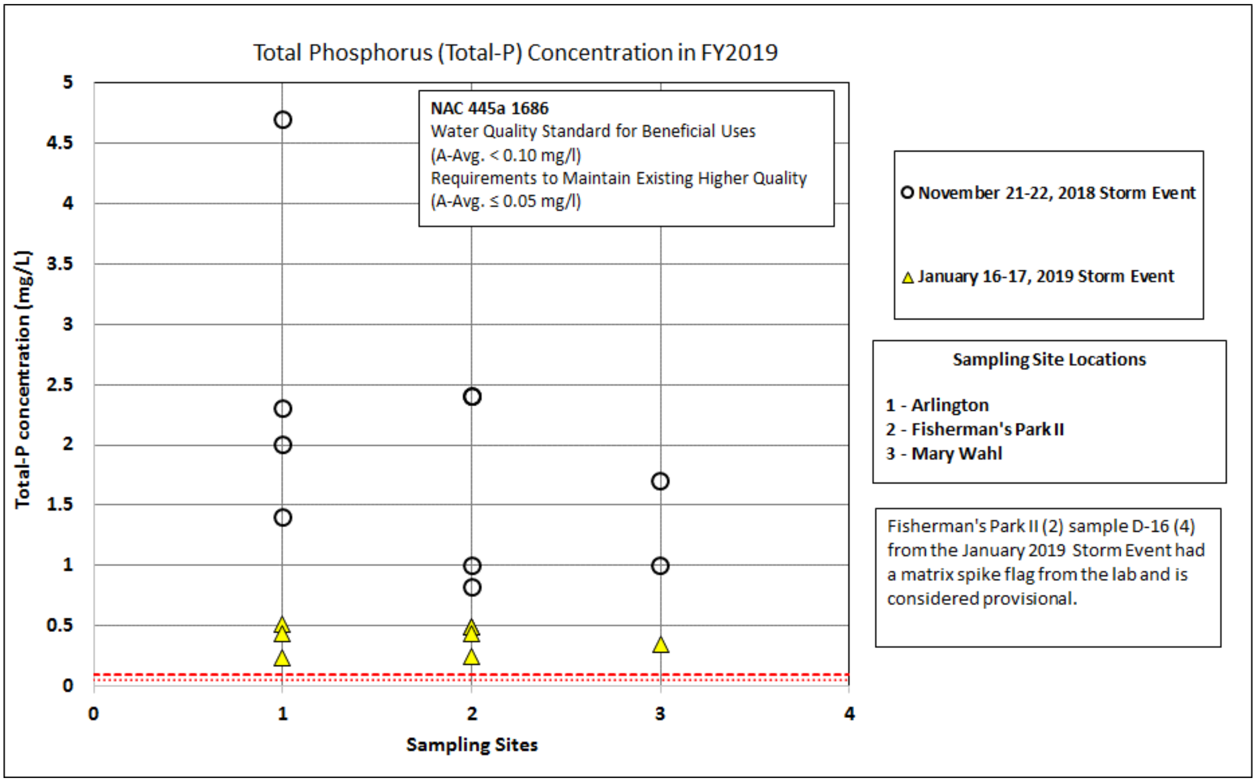


Figure 5-27 Total-P Concentrations for Stormwater Urban Outfalls to the Truckee River from E. McCarran upstream to Idlewild, FY2019

Total-P concentrations measured from samples collected in North Truckee Drain ranged between 0.10 mg/L and 0.45 mg/L (**Figure 5-28**). Storm event Total-P concentrations were higher than baseflow concentrations at Big Fish Drive, but Total-P concentration in the winter base flow samples was greater than storm event and summer baseflow samples at Orr Ditch.

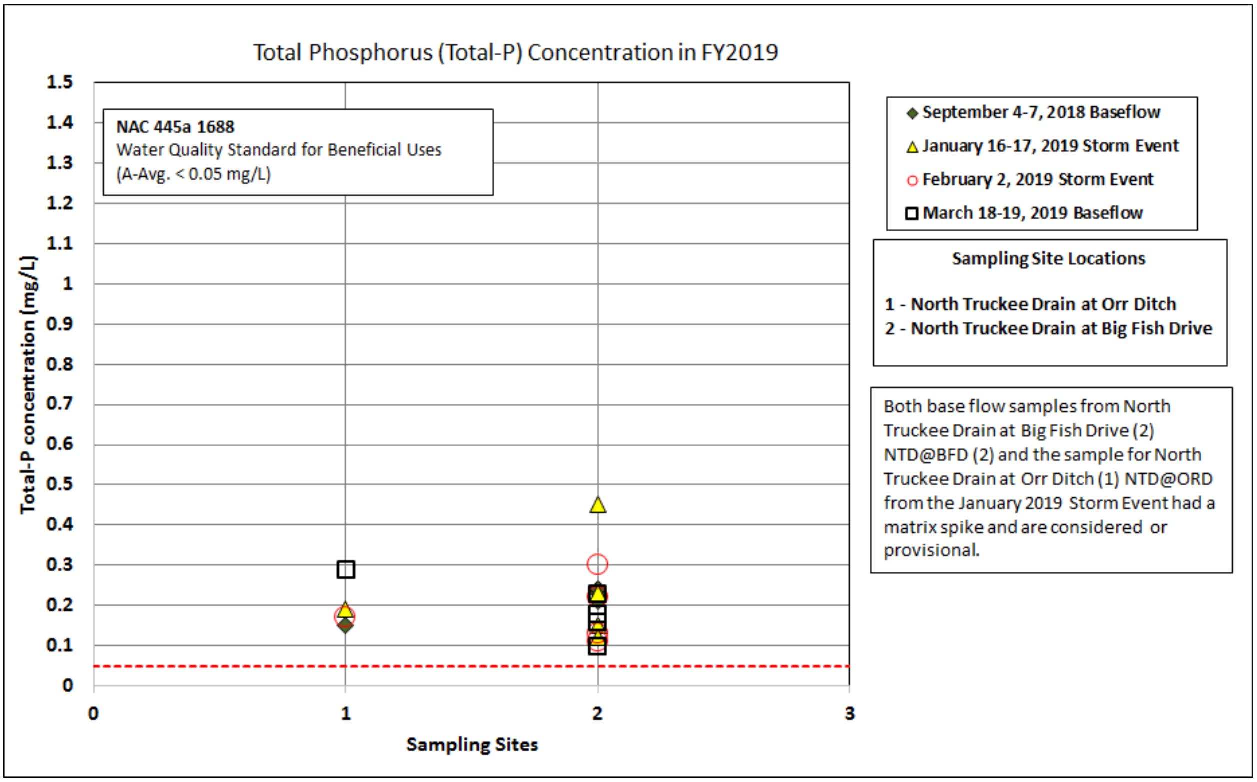


Figure 5-28 Total-P Concentrations for the North Truckee Drain, FY2019

Total-P concentrations measured from samples collected in Steamboat Creek at Rhodes Road) ranged from 0.13 mg/L to 0.40 mg/L (**Figure 5-29**). Results from all samples meet the WQS for this segment of Steamboat Creek (S.V. ≤ 0.33 mg/L), except the summer baseflow sample (0.40 mg/L).

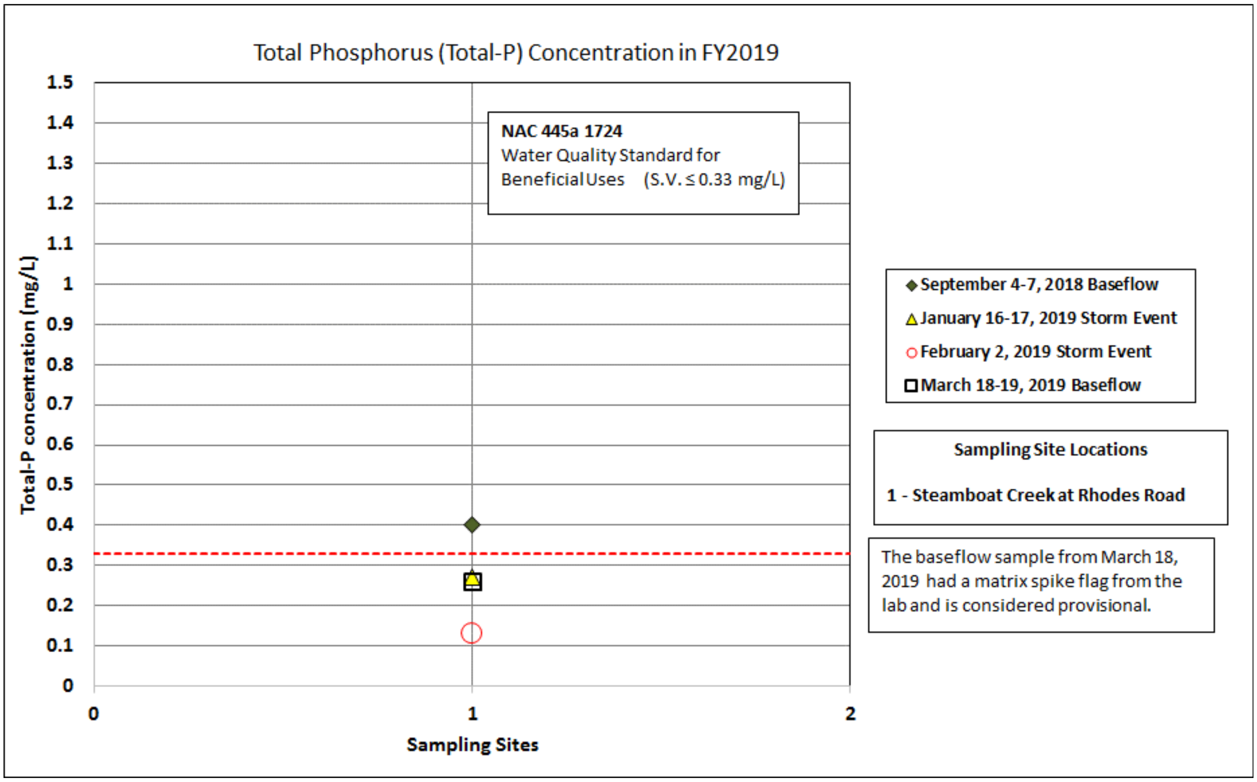


Figure 5-29 Total-P Concentrations for Steamboat Creek at Rhodes Road, FY2019

Total-P concentrations measured from samples collected in Steamboat Creek and tributaries below Rhodes Road ranged from 0.05 mg/L to 0.41 mg/L (**Figure 5-30**). Numeric criteria to protect water quality does not exist for this segment of Steamboat Creek and its tributaries, but the Tributary Rule applies for the Truckee River (A-Avg. ≤0.05, NAC 445a. 1688).

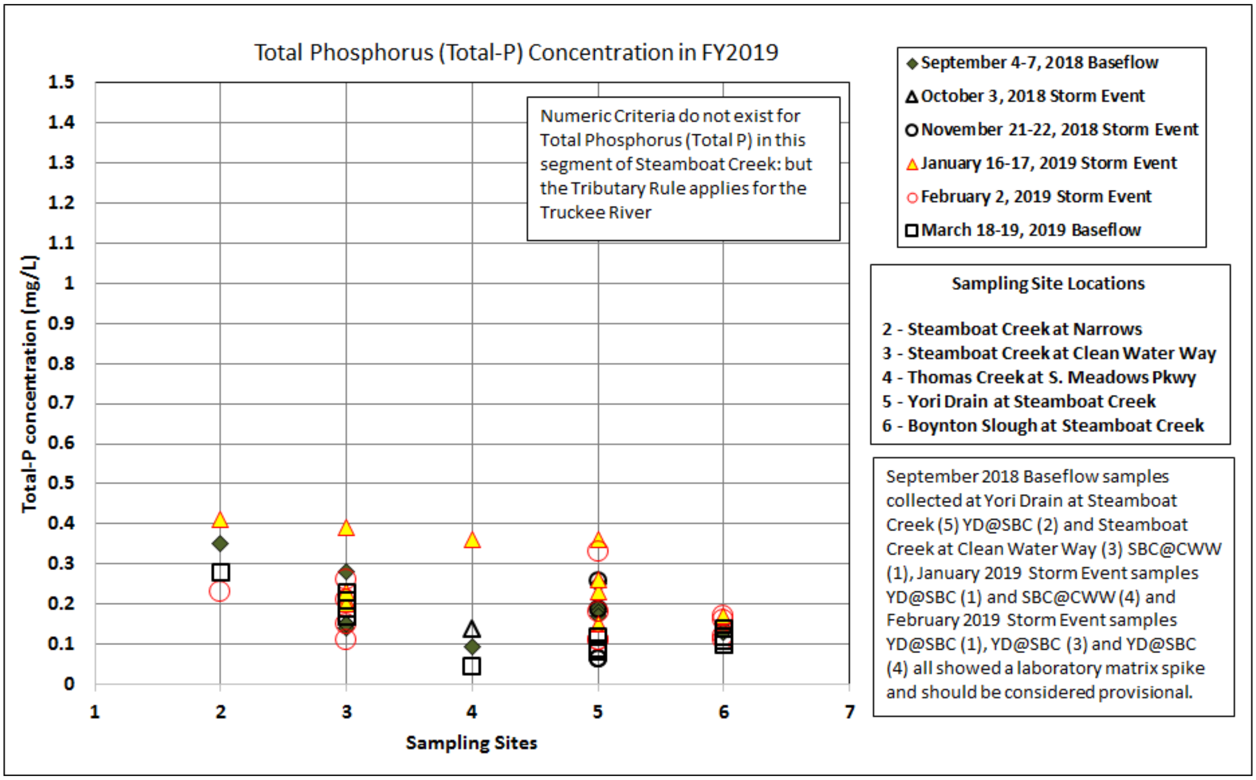


Figure 5-30 Total-P Concentrations for Steamboat Creek and Tributaries, FY2019

Total-P concentrations measured from samples collected in Whites Creek ranged from 0.05 mg/L to 0.22 mg/L (**Figure 5-31**). Storm samples were collected in the November 2018 and February 2019 storm events. Both storm water samples exceeded WQS to protect beneficial uses (A-Avg. ≤ 0.10 mg/L, NAC 445a. 1758) but the summer baseflow sample met this standard. Total-P was not detected in the winter baseflow sample.

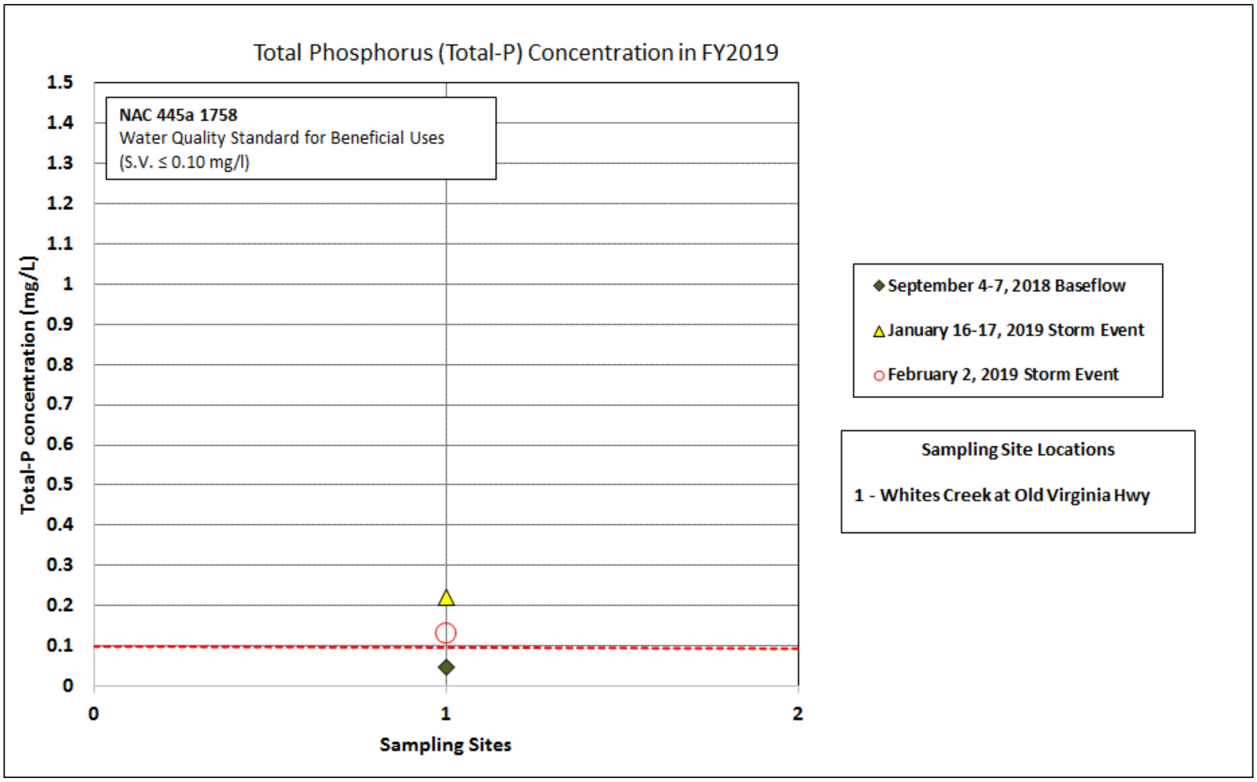


Figure 5-31 Total P Concentrations for Whites Creek, FY2019

Orthophosphate (Ortho-P) concentrations for storm events and ambient samples collected in WY2019 are shown in **Figure 5-32**, **Figure 5-33**, **Figure 5-34, Figure 5-35, Figure 5-36, and Figure 5-37** grouped by their listed water body and specific numeric criteria (if applicable).

Ortho-P concentrations measured from two tributaries and a stormwater urban outfall that discharge to the Truckee River upstream of Idlewild ranged from 0.02 mg/L to 0.31 mg/L (**Figure 5-32**). Most concentrations exceeded WQS for beneficial uses (≤0.05 mg/L, NAC 445a. 1684) except the January 2019 storm and winter baseflow concentrations measured in Alum Creek. The highest concentrations were measured from both baseflow samples collected from Chalk Creek and storm samples collected from Oxbow Park outfall.

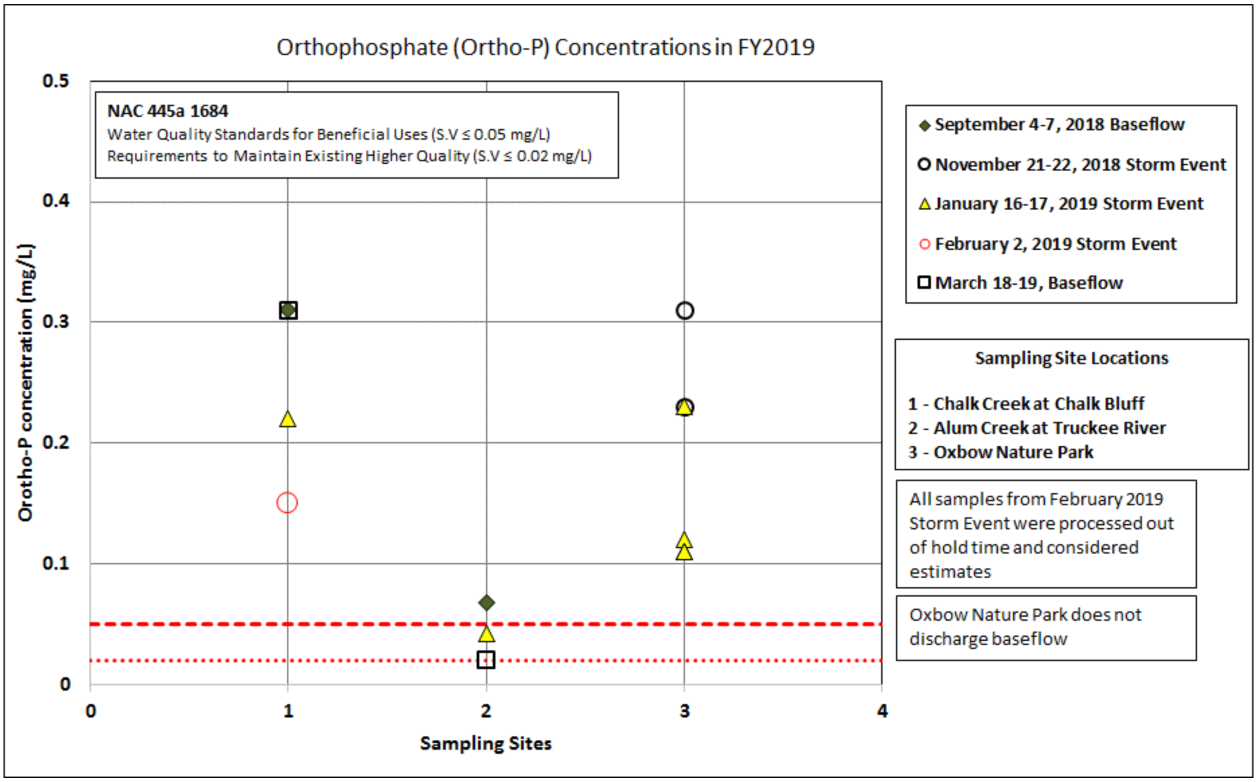


Figure 5-32 **Ortho-P Concentrations for Tributaries and a Stormwater Urban Outfall to the Truckee River upstream of Idlewild, FY2019**

Ortho-P concentrations measured from three stormwater urban outfalls that discharge to the Truckee River between E. McCarran and Idlewild ranged from 0.12 mg/L to as high as 1.3 mg/L (**Figure 5-33**). All concentrations exceeded WQS for beneficial uses (≤0.05 mg/L). Highest concentrations were measured in stormwater collected from the Arlington outfall during the November 2018 storm event.

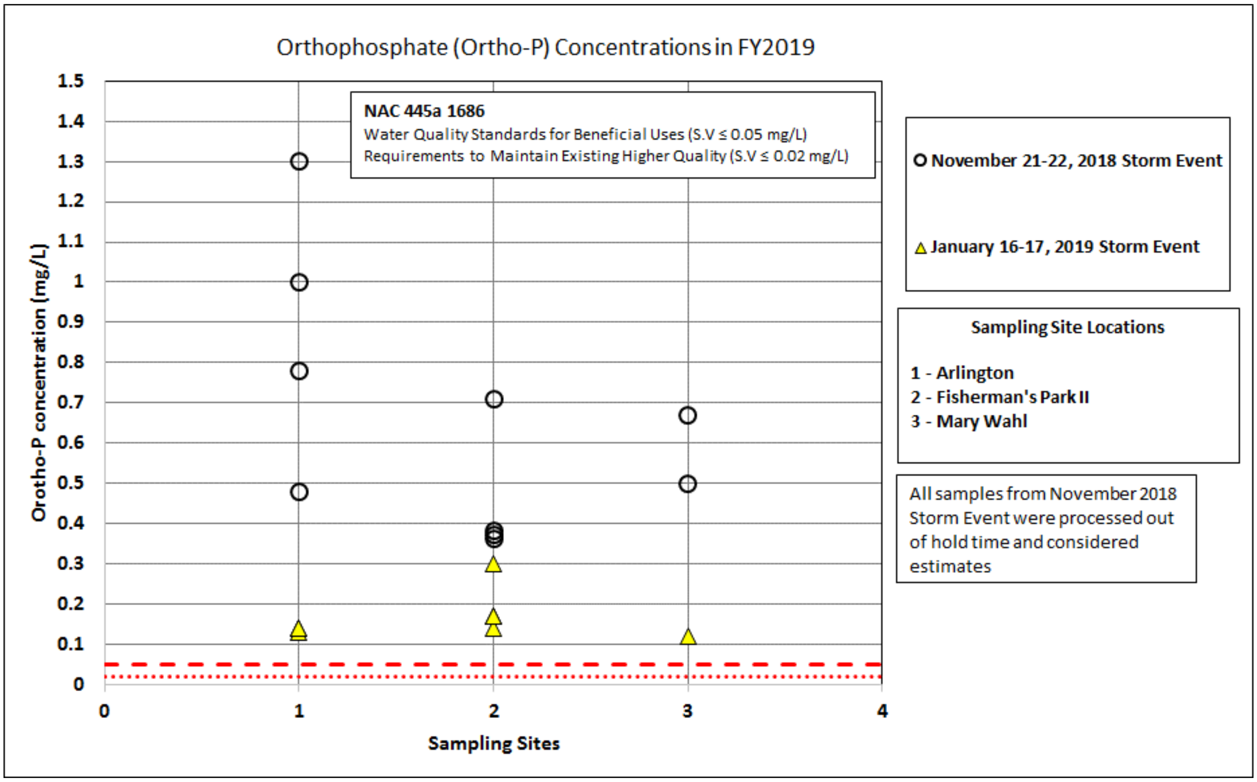


Figure 5-33 **Ortho-P Concentrations for Stormwater Urban Outfalls to the Truckee River from E. McCarran upstream to Idlewild, FY2019**

Ortho-P concentrations measured from samples collected in the North Truckee Drain ranged between 0.06 mg/L and 0.30 mg/L (**Figure 5-34**). Concentrations were higher in winter baseflow samples than in summer baseflow samples at Orr Ditch, while the opposite was true for Big Fish Drive. The highest Ortho-P concentrations were measured in samples collected during the January 16-17, 2019 storm event.

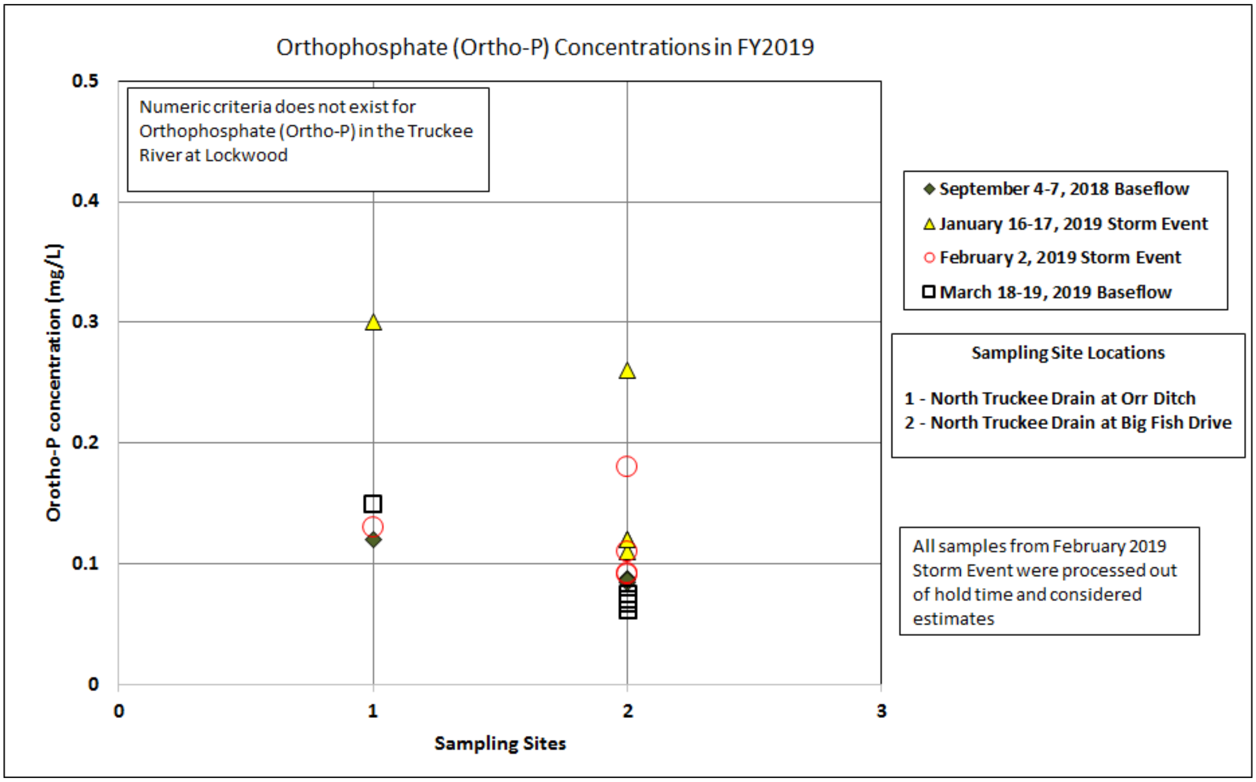


Figure 5-34 Ortho-P Concentrations for the North Truckee Drain, FY2019

Ortho-P concentrations measured from samples collected in Steamboat Creek at Rhodes Road ranged from 0.08 mg/L to 0.26 mg/L from storm event and baseflow samples (**Figure 5-35**). Highest concentrations were measured in the sample collected during summer baseflow.

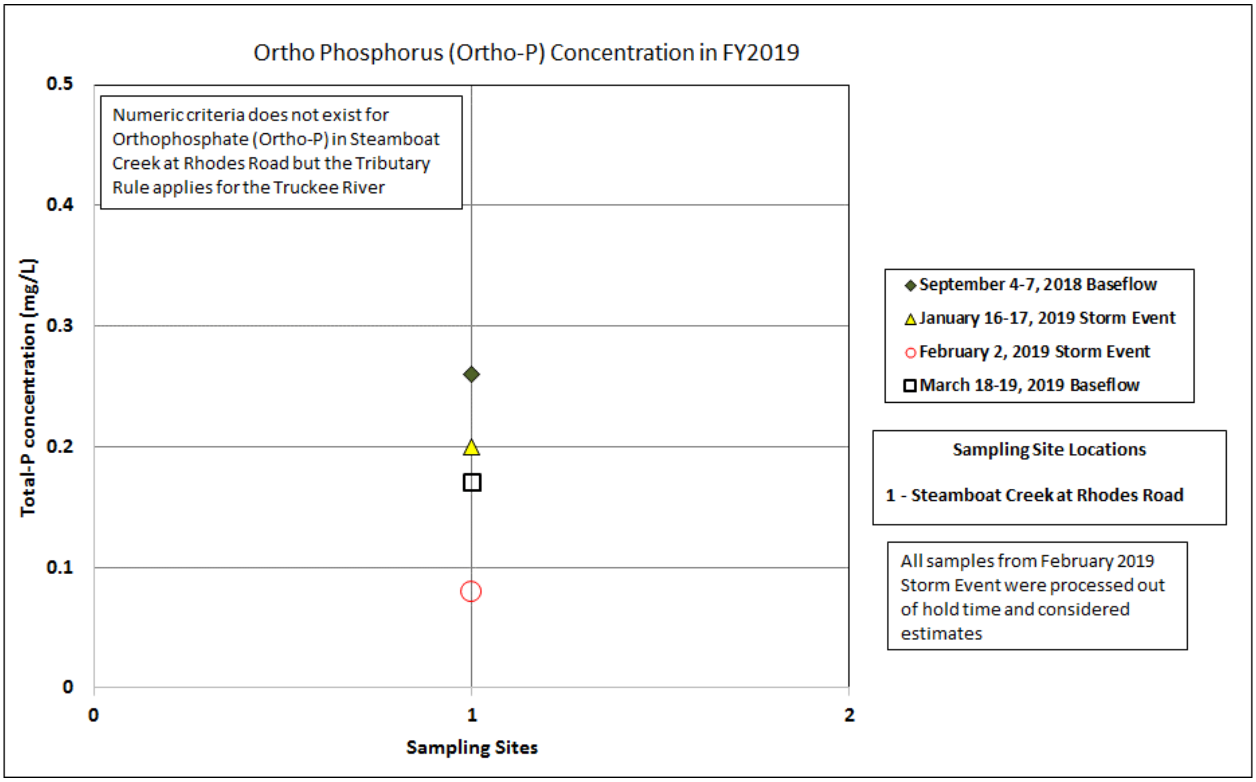


Figure 5-35 Ortho-P Concentrations for Steamboat Creek at Rhodes Road, FY2019

Ortho-P concentrations measured from samples collected in Steamboat Creek and tributaries below Rhodes Road ranged from 0.02 mg/L to 0.38 mg/L (**Figure 5-36**). Highest concentrations were measured in Steamboat Creek at Narrows and Thomas Creek during the January 2019 storm event. Numeric criteria to protect water quality does not exist for this segment of Steamboat Creek and its tributaries but the Truckee River WQS for Ortho-P is S.V ≤0.02 (NAC 445a. 1686) and applies to Steamboat Creek via the Tributary Rule.

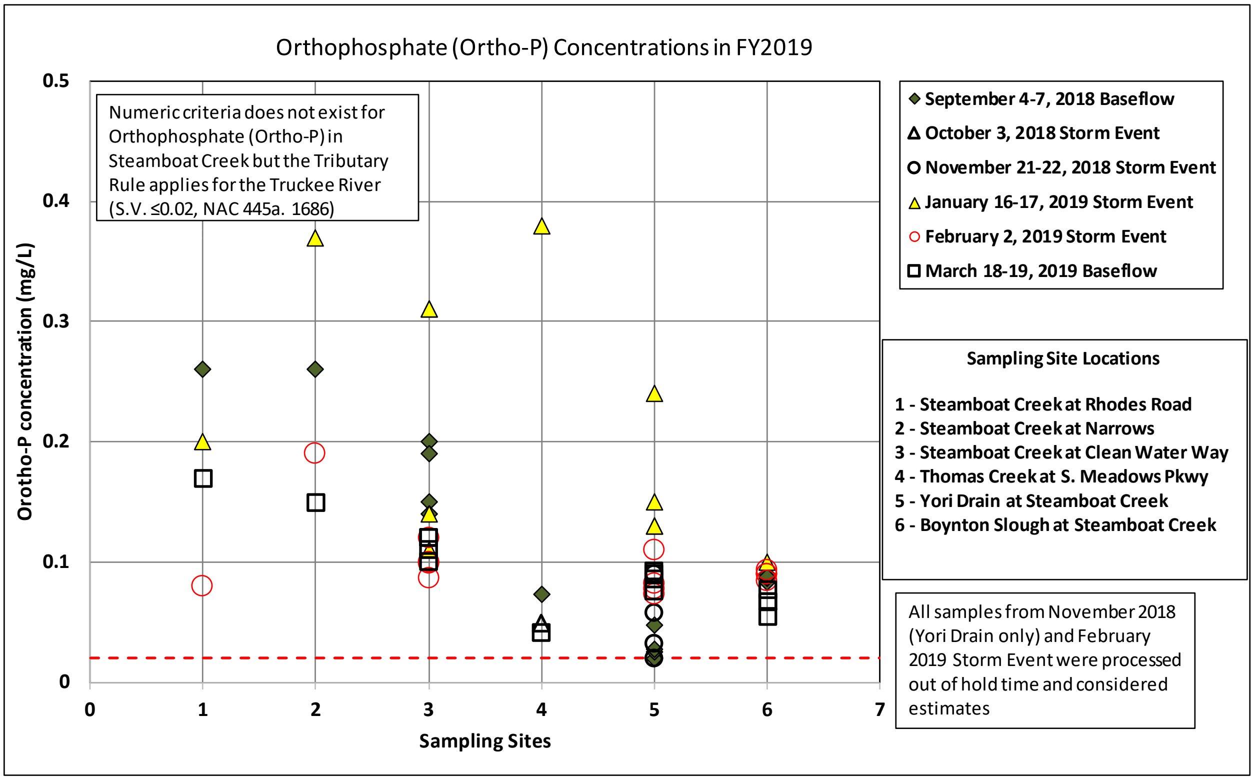


Figure 5-36 Ortho-P Concentrations for Steamboat Creek and Tributaries, FY2019

Ortho-P concentrations measured from samples collected in Whites Creek ranged from 0.02 mg/L to 0.33 mg/L (**Figure 5-37**). The highest concentration was measured in a sample during the January 2019 storm event. Ortho-P was not detected in the winter baseflow sample.

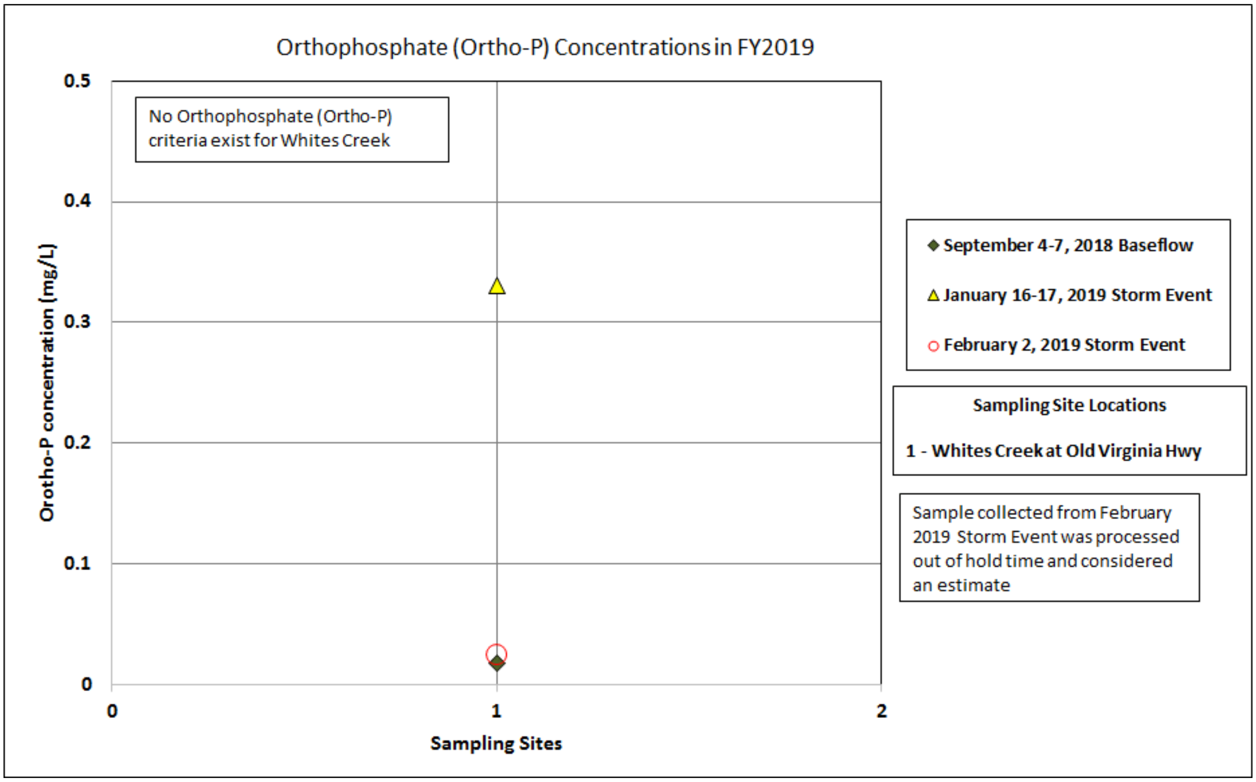


Figure 5-37 Ortho-P Concentrations for Whites Creek, FY2019

5.4.3 TOTAL DISSOLVED SOLIDS AND TOTAL SUSPENDED SOLIDS

TDS concentrations for storm events and ambient samples collected in FY2019 are shown in **Figure 5-38**, **Figure 5-39**, **Figure 5-40**, **Figure 5-41**, **Figure 5-42**, and **Figure 5-43**, grouped by their listed water body and specific numeric criteria. Vertical axes in all graphs are logarithmic to show the range of values detected.

TDS concentrations measured in samples from two tributaries and one stormwater urban outfall that discharge to the Truckee River upstream of Idlewild ranged from 27 mg/L to as high as 2,900 mg/L (**Figure 5-38**). We compare these concentrations to single value criterion used to maintain existing higher quality (≤ 95 mg/L) for this segment of Truckee River; the annual-average numeric criterion to protect beneficial uses is shown for reference. All baseflow and storm event samples collected in FY2019 exceeded the requirement stated above; except for a single storm sample (January 2019) collected from Oxbow Nature Park, which was below this requirement.

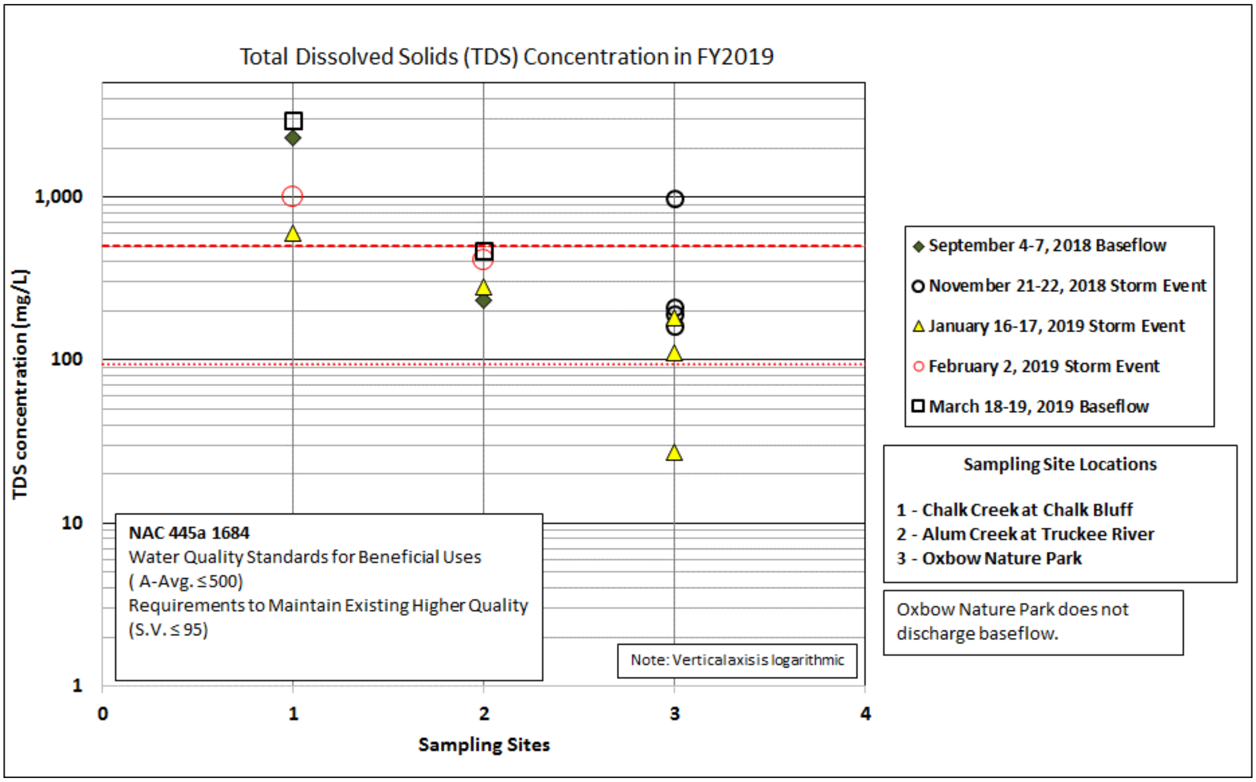


Figure 5-38 **Total Dissolved Solids (TDS) Concentrations for Tributaries and a Stormwater Urban Outfall to the Truckee River upstream of Idlewild, FY2019**

TDS concentrations measured from three stormwater urban outfalls that discharge to the Truckee River between E. McCarran and Idlewild ranged from 18 mg/L to 1000 mg/L (**Figure 5-39**). We compare these concentrations to requirements used to maintain existing higher quality (≤ 120 mg/L) for this segment of Truckee River; annual-average numeric criterion to protect beneficial uses is shown for reference. First flush samples at all three sites exceeded this standard during the November 2018 storm event.

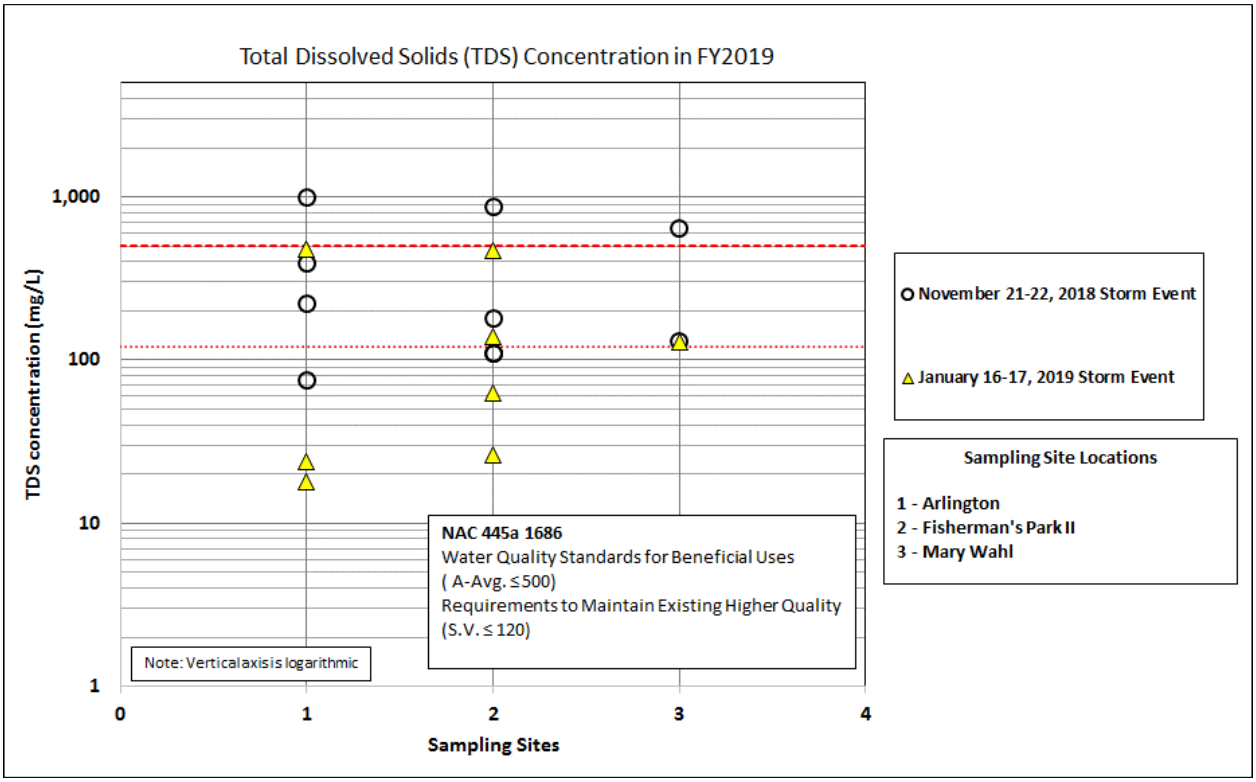


Figure 5-39 TDS Concentrations for Stormwater urban outfalls to the Truckee River from E. McCarran upstream to Idlewild, FY2019

TDS concentrations measured from samples collected in North Truckee Drain, a tributary to the Truckee River upstream of Lockwood ranged from 65 mg/L to as high as 1,100 mg/L (**Figure 5-40**). We compare these concentrations to requirements used to maintain existing higher quality (≤ 260 mg/L) for this segment of Truckee River; annual-average numeric criterion to protect beneficial uses is shown for reference. All concentrations measured in North Truckee Drain exceeded this requirement, with the exception of some storm event samples collected from the Big Fish Drive station. The highest concentrations were measured in samples from winter baseflow.

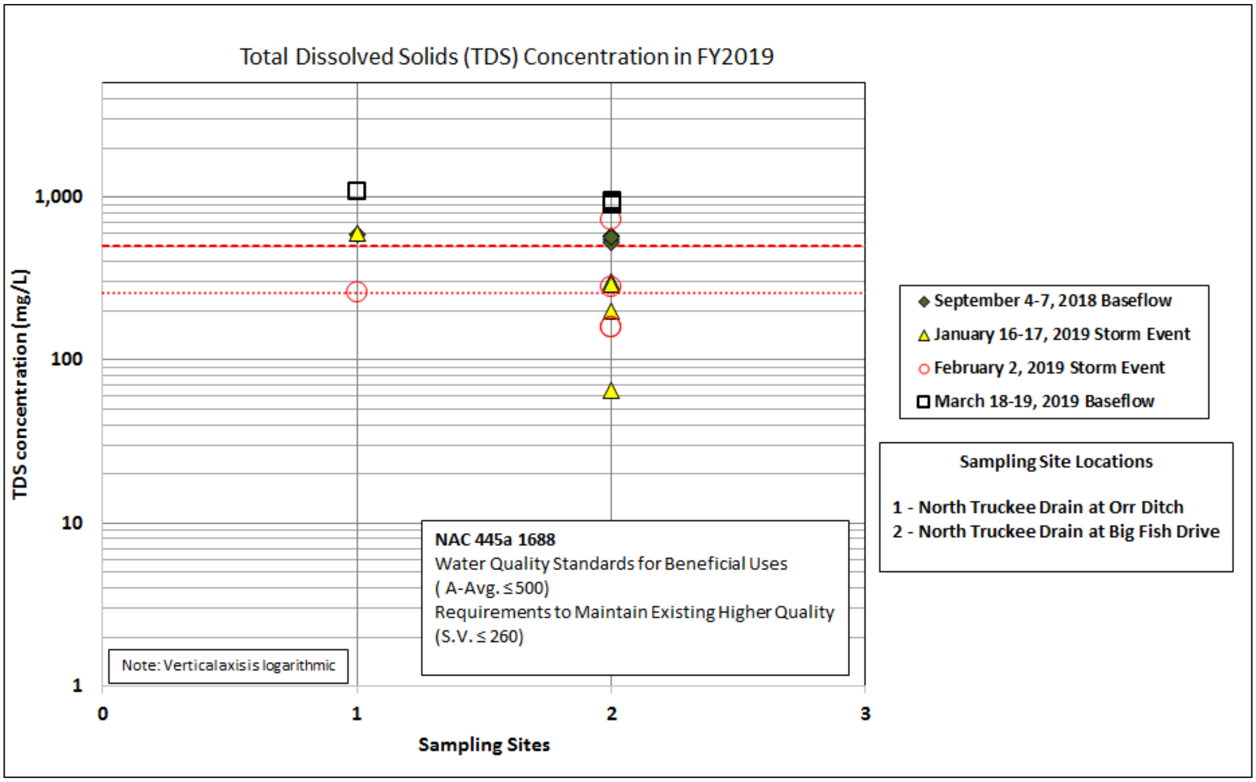


Figure 5-40 TDS Concentrations the North Truckee Drain, FY2019

TDS concentrations measured from samples collected in Steamboat Creek at Rhodes Road ranged from 150 mg/L to 290 mg/L (**Figure 5-41**). These values meet the WQS for TDS established for this segment of Steamboat Creek (≤500 mg/L). Baseflow samples had the highest concentrations.

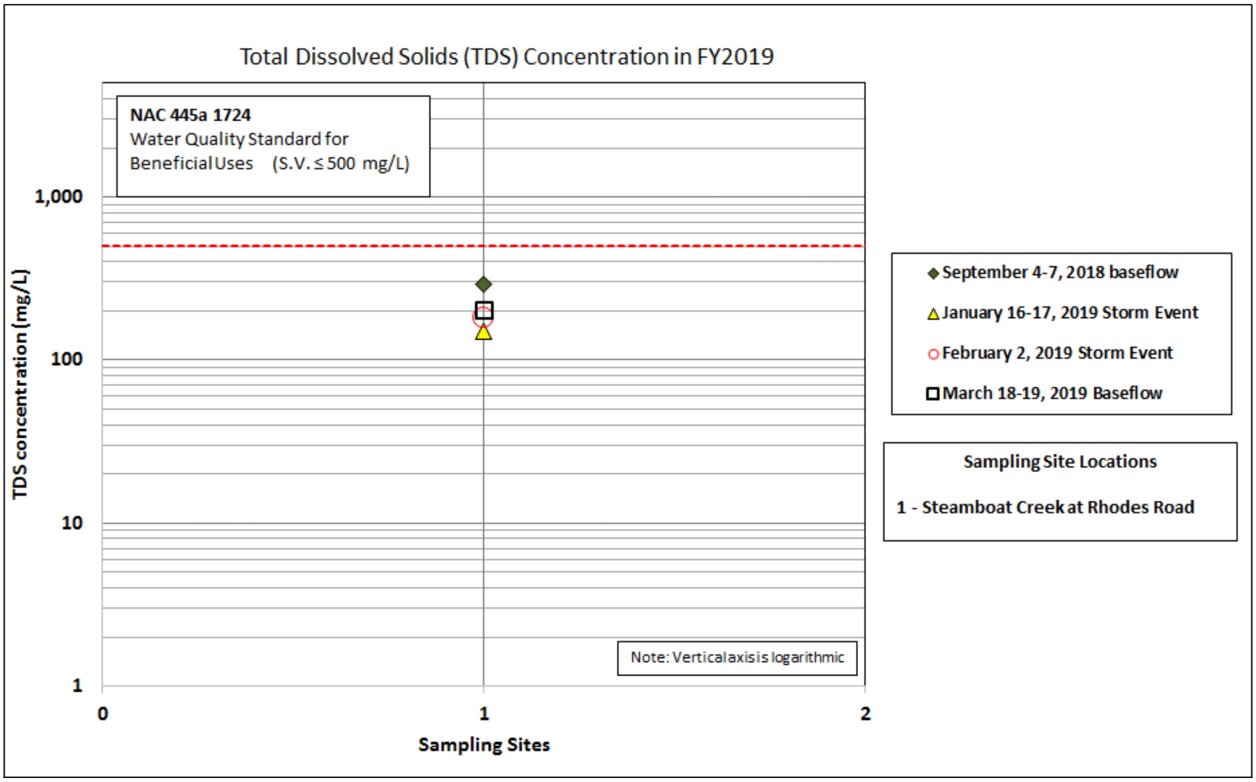


Figure 5-41 TDS Concentrations for Steamboat Creek at Rhodes Road, FY2019

TDS concentrations measured from samples collected at stations in Steamboat Creek and tributaries downstream of Rhodes Road ranged from 83 mg/L to as high as 690 mg/L (**Figure 5-42**). TDS concentrations were measured above 200 mg/L consistently from Steamboat Creek in both storm events and baseflow. The highest TDS concentration was measured during summer baseflow at The Narrows. WQS established to protect water quality in Steamboat Creek and tributaries do not exist for TDS. However, because there is an existing Total Maximum Daily Load (TMDL) for TDS on the Truckee River, as a tributary to the Truckee, Steamboat Creek must be protective of the TMDL. The maximum annual average anti-degradation levels at and above Lockwood is 215 mg/L.

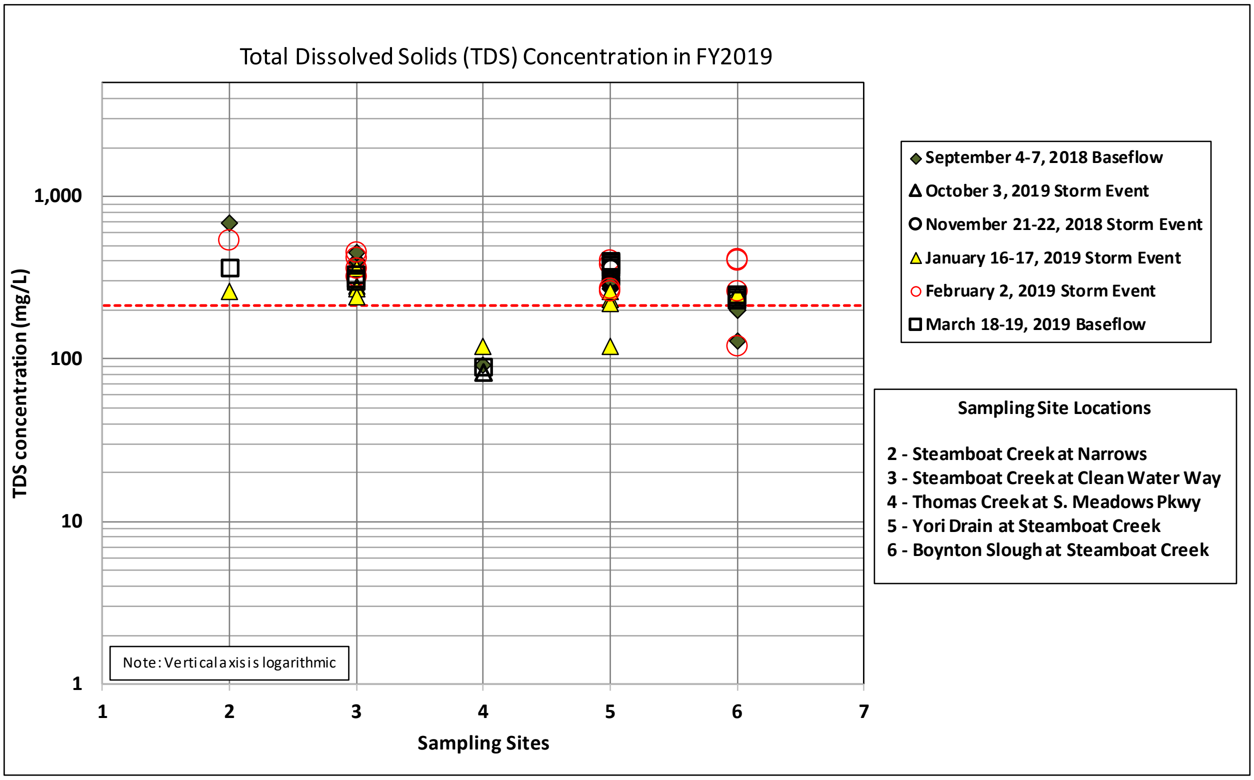


Figure 5-42 TDS Concentrations for Steamboat Creek and Tributaries, FY2019

TDS concentrations measured from samples collected in Whites Creek ranged from 50 mg/L to 68 mg/L (**Figure 5-43**). A single value WQS does not exist for Whites Creek; however, an annual-average criterion of ≤ 500 mg/L is established to protect beneficial uses. All concentrations measured from Whites Creek met this WQS.

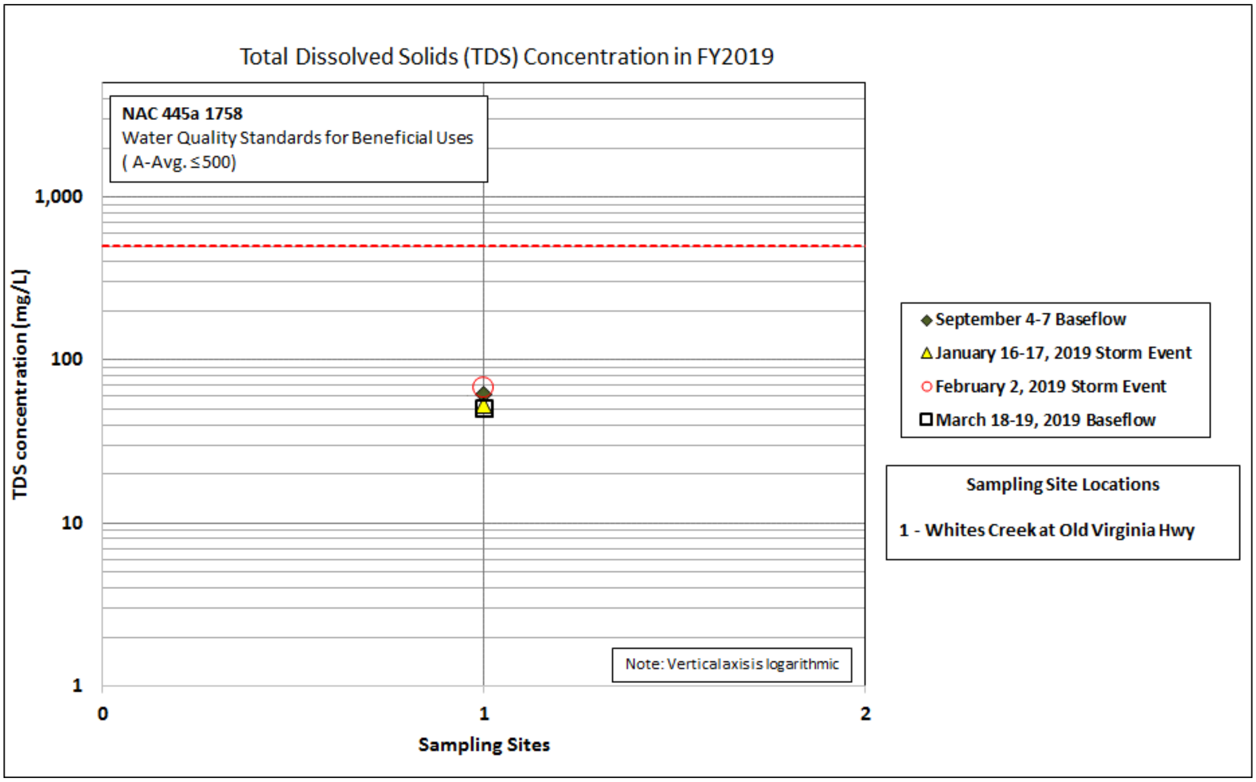


Figure 5-43 TDS Concentrations for Whites Creek, FY2019

TSS concentrations for storm event and ambient samples collected in FY2019 are shown in **Figure 5-44**, **Figure 5-45**, **Figure 5-46**, **Figure 5-47**, and **Figure 5-48**, grouped by their listed water body and specific WQS or numeric criteria. Vertical axes in all graphs are logarithmic to better show the range in values detected.

TSS concentrations measured from two tributaries and one stormwater urban outfall that discharge to the Truckee River upstream of Idlewild ranged from 4.0 mg/L to as high as 610 mg/L (**Figure 5-44**). We compare these concentrations to single value WQS used to protect beneficial uses (≤ 25 mg/L) for this segment of the Truckee River; annual-average numeric criterion (≤ 15 mg/L) to maintain higher quality is shown for reference. Most storm sample concentrations from each station exceeded the WQS; the highest concentration was collected in samples from Oxbow Nature Park during the November 2018 storm event. Winter baseflow sample concentrations for Alum Creek also exceeded the WQS for TSS.

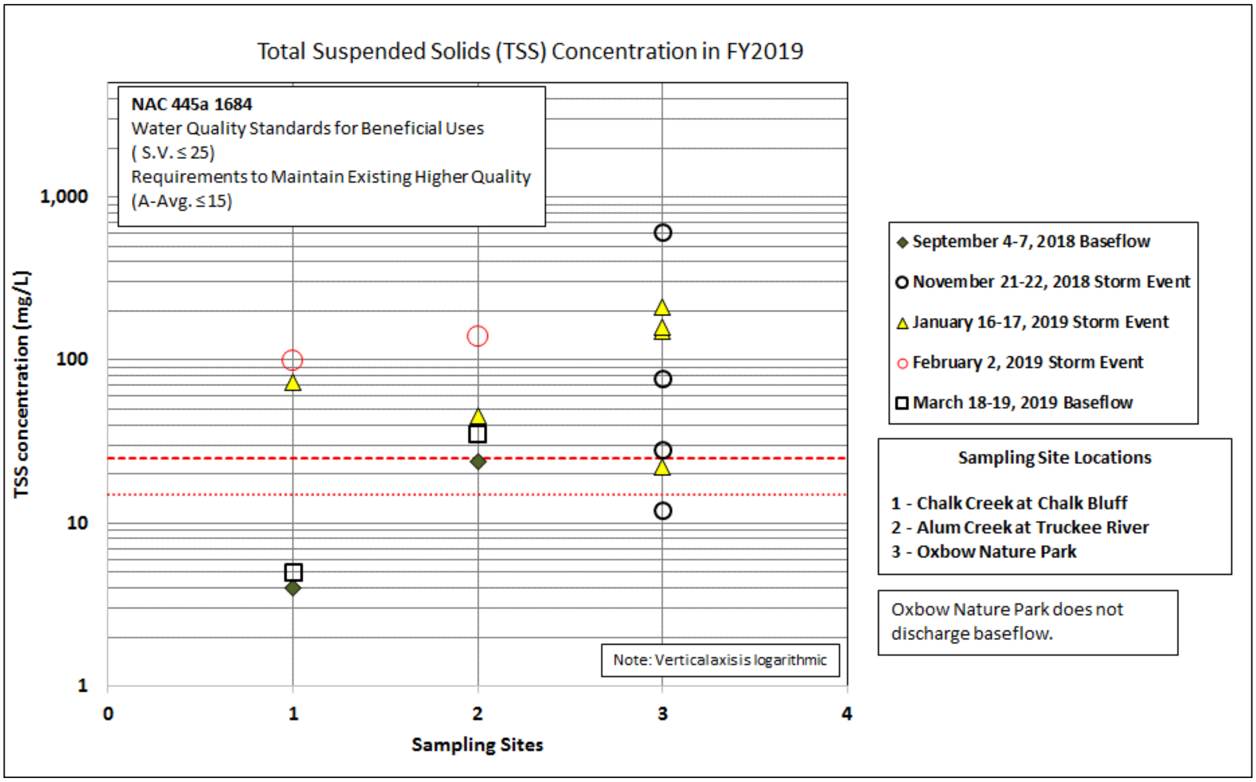


Figure 5-44 Total Suspended Solids (TSS) Concentrations for Tributaries and a Stormwater Urban Outfall to the Truckee River upstream of Idlewild, FY2019

TSS concentrations measured from three stormwater urban outfalls that discharge to the Truckee River between E. McCarran and Idlewild ranged from 23.0 mg/L to as high as 550 mg/L (**Figure 5-45**). We compare these concentrations to single value WQS used to protect beneficial uses (≤ 25 mg/L) for this segment of the Truckee River; annual-average numeric criterion (≤ 15 mg/L) to maintain higher quality is shown for reference. All storm event samples collected from these three stormwater urban outfalls exceeded the WQS with the exception of one composite sample from Fisherman's Park II during the January 2019 storm. Stormwater samples from the Arlington outfall exhibited the highest TSS concentrations overall.

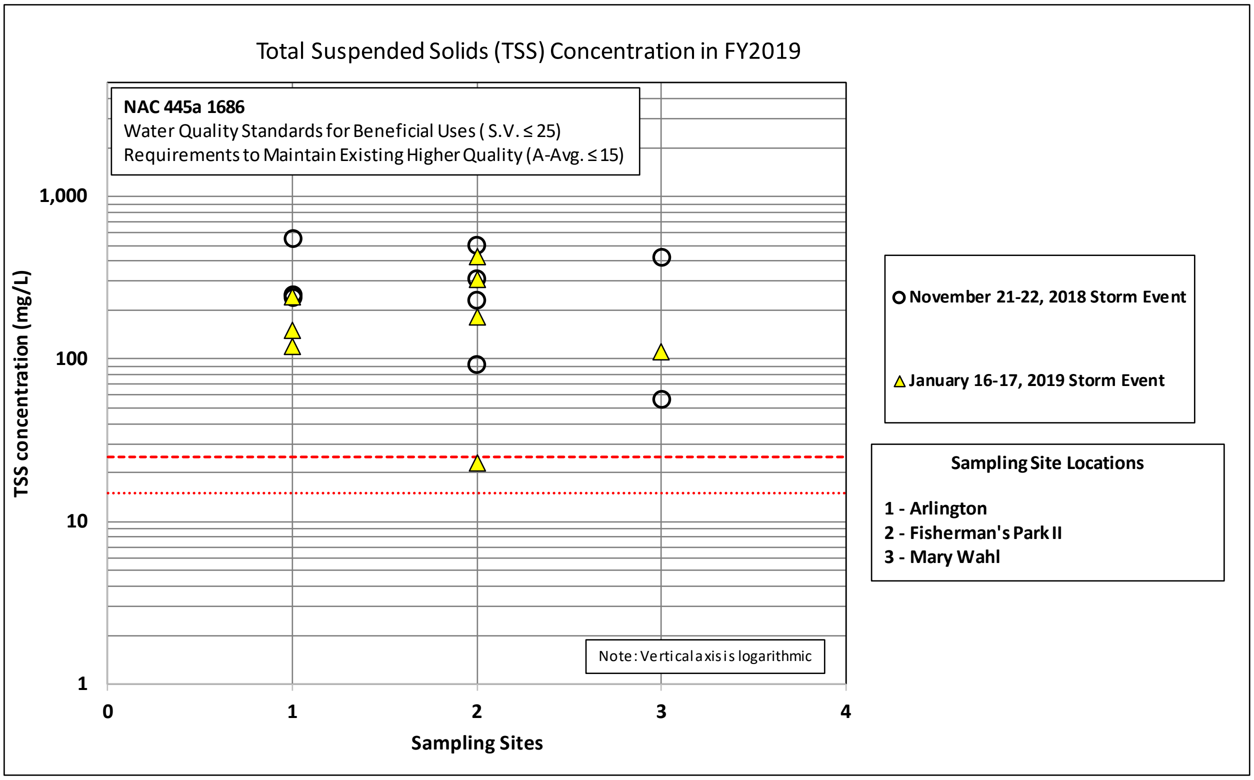


Figure 5-45 TSS Concentrations for Stormwater Urban Outfalls to the Truckee River from E. McCarran Upstream to Idlewild, FY2019

TSS concentrations measured from samples collected in the North Truckee Drain ranged from 8 mg/L to as high as 230 mg/L (**Figure 5-46**). We compare these concentrations to single value WQS used to protect beneficial uses (≤ 50 mg/L) for this segment of the Truckee River; annual-average numeric criterion (≤ 25 mg/L) to maintain higher quality is shown for reference. Most storm sample concentrations exceeded the WQS, with the exception of one composite sample each at Big Fish Drive from January and February 2019 storms. Also, all of the summer baseflow samples collected at Big Fish Drive exceeded the WQS, while only two out of the four samples from winter baseflow were in exceedance.

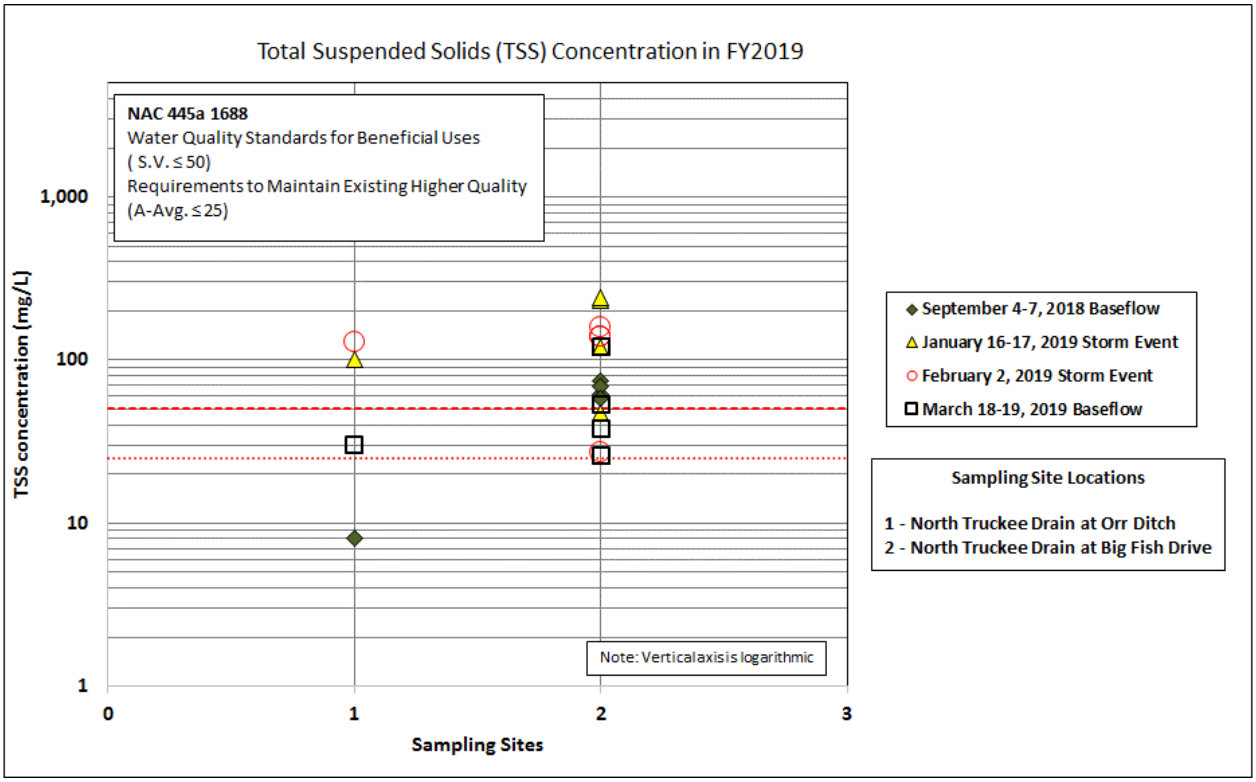


Figure 5-46 TSS Concentrations for the North Truckee Drain, FY2019

TSS concentrations measured from samples collected at three different stations in Steamboat Creek and tributaries downstream from Rhodes Road ranged from 5.0 mg/L to as high as 700 mg/L (**Figure 5-47**). There are no numerical standards for TSS in Steamboat Creek or its tributaries. Highest TSS concentrations were measured from Steamboat Creek at Clean Water Way and Yori Drain. In general, storm event concentrations exceeded baseflow concentrations across all stations.

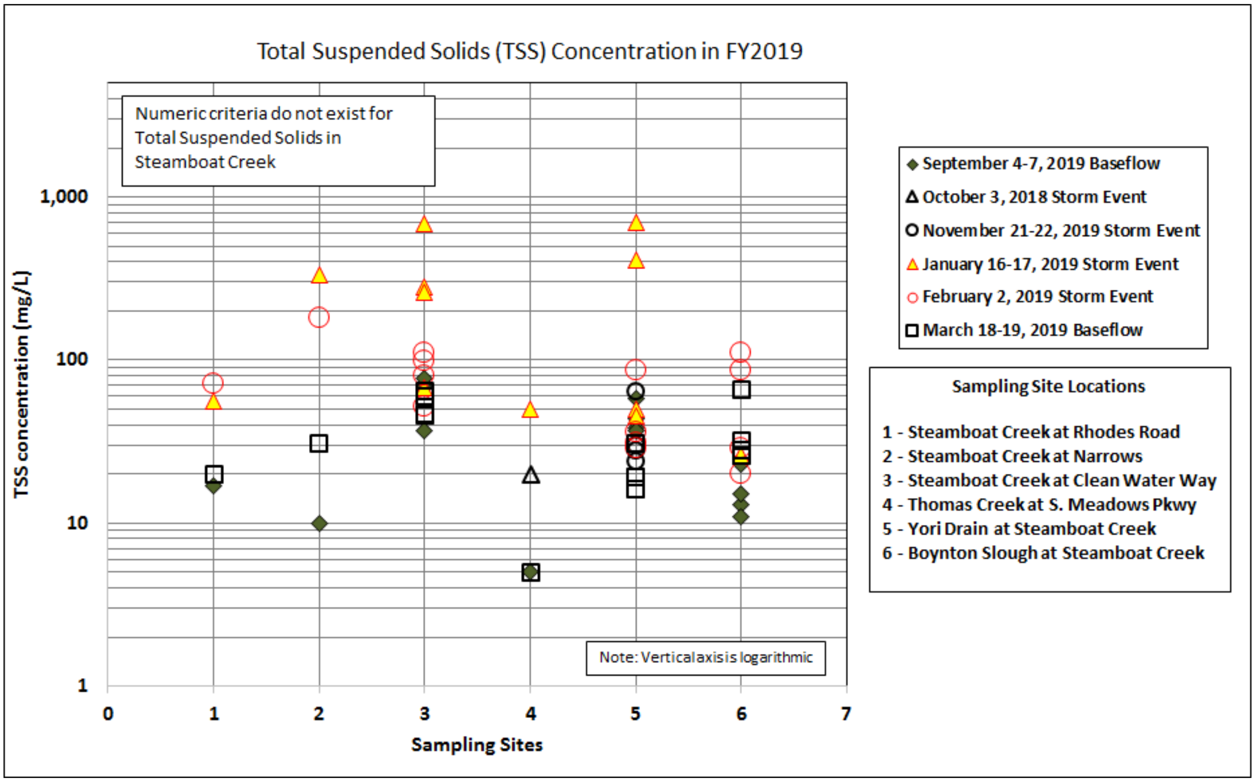


Figure 5-47 TSS Concentrations for Steamboat Creek and Tributaries, FY2019

TSS concentrations measured from samples collected in Whites Creek ranged from 2.0 mg/L to as high as 44 mg/L (**Figure 5-48**). WQS do not exist for Whites Creek. Storm sample concentrations were higher than baseflow concentrations.

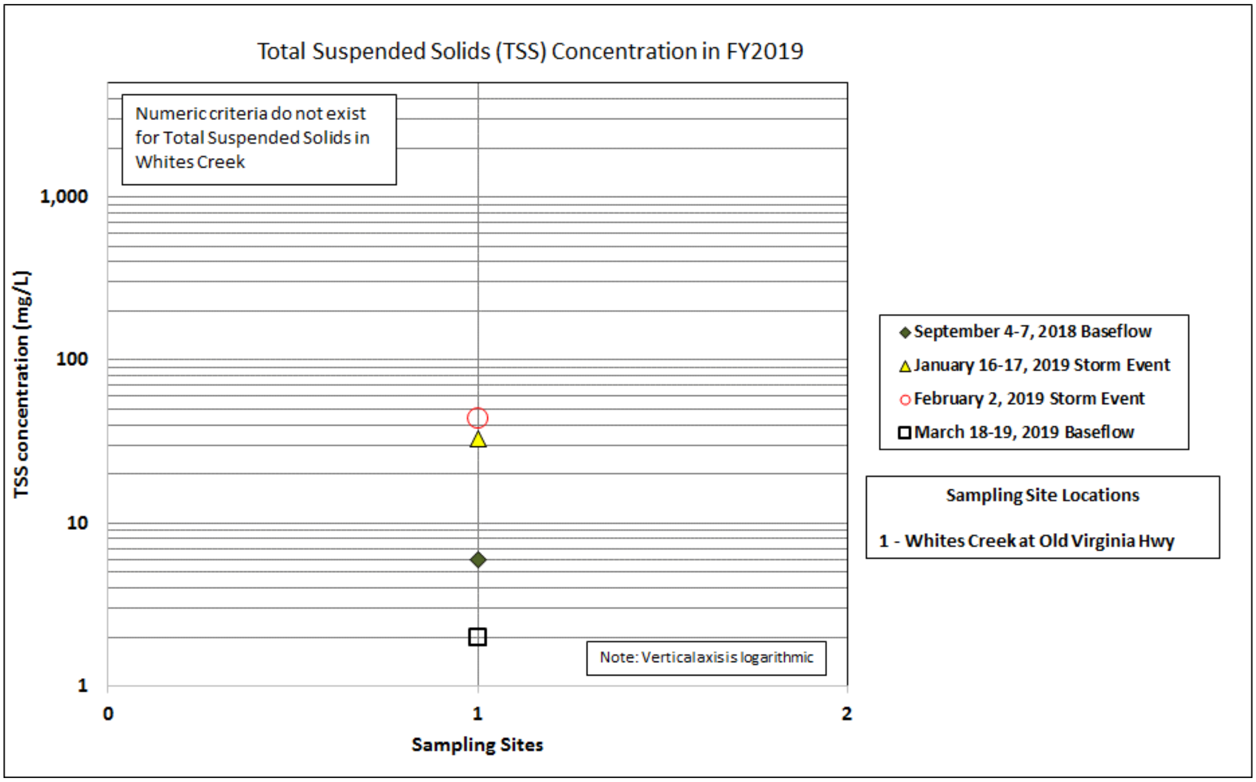


Figure 5-48 TSS Concentrations for Whites Creek, FY2019

5.4.4 ESCHERICHIA COLI BACTERIA

E. coli is an indicator of potential human health impacts from exposure to surface waters that contain excessive contamination from wildlife or human excrement and untreated wastewater. High counts of bacteria may not necessarily confirm the presence of pathogens but provides an indicator of risk. All *E. coli* WQS that cover this stormwater program require a S.V. ≤ 410 MPN/1000 (NAC 445a. 1684, 1686, 1688, 1724 and 1758), with the exception of Steamboat Creek at Clean Water Way to the confluence of the Truckee river which has a WQS of S.V ≤ 576 MPN/1000 (NAC 445a. 1726). Efforts to collect and analyze for *E. coli* are limited by a holding time of 8 hours for proper analysis. In FY2019, at least one storm sample from each of the following stations-three tributaries: Whites Creek, Alum Creek, and Steamboat Creek at Rhodes Road and three urban outfalls: Arlington, Fisherman's Park II and Mary Wahl during the January 2019 storm. *E. coli* samples were also collected and analyzed during winter and summer baseflow at tributary stations (urban outfalls only have flow during storm events) identified for E. coli sampling in the 2018 SAP (**Figures 5-49, 5-50 and 5-51**).

E. coli counts for the January 2019 storm event ranged between 90 MPN/100 mL and 816 MPN/100 mL in stormwater. The Whites Creek and Steamboat Creek samples from this storm event both exceeded their individual WQS. E. coli counts ranged between 6 MPN/100 mL and 15 MPN/100 mL in winter baseflow and 86 MPN/100 mL and 980 MPN/100 mL in summer baseflow. Summer baseflow samples collected at Whites Creek and Steamboat Creek at Rhodes Road, also, both exceeded their individual WQS. USEPA guidance for fresh water contact recreation in surface waters were established at 126 CFU/100 mL to protect public health (US EPA, 1986).

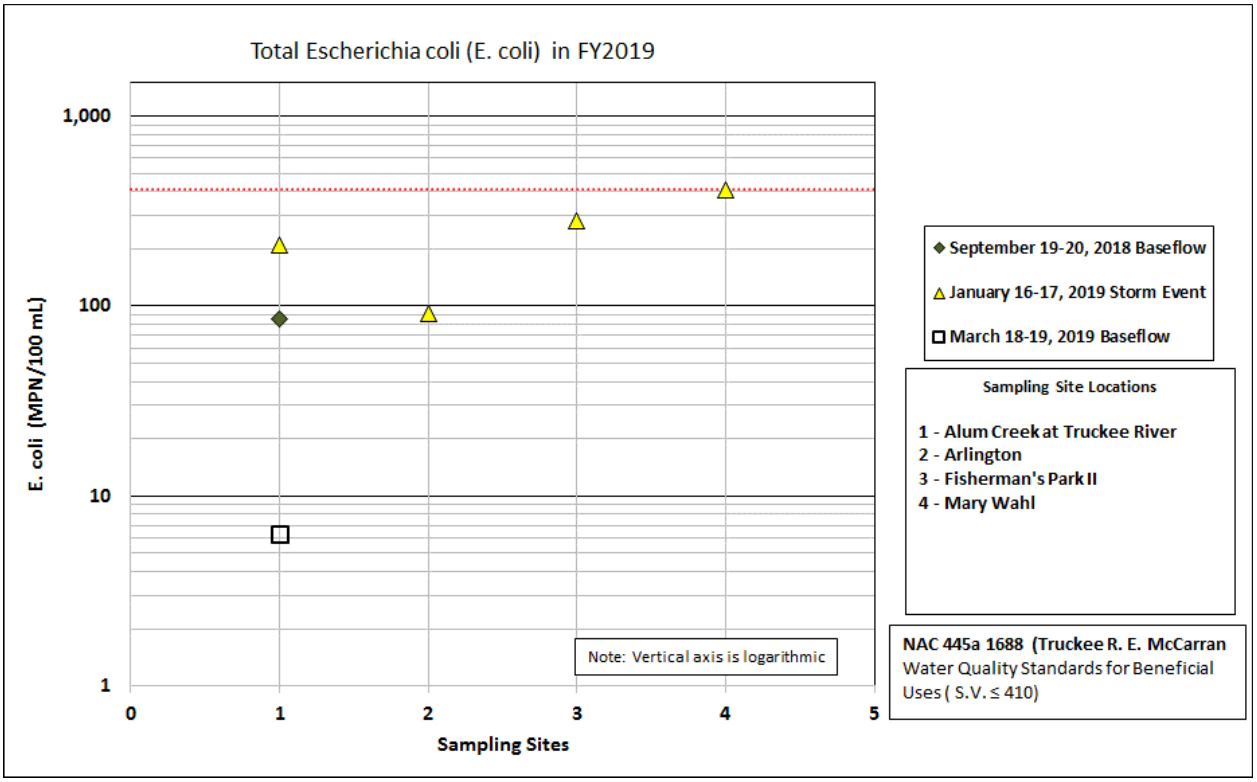


Figure 5-49 E. coli Counts for Samples Collected in Alum Creek and Urban Outfalls, FY2019

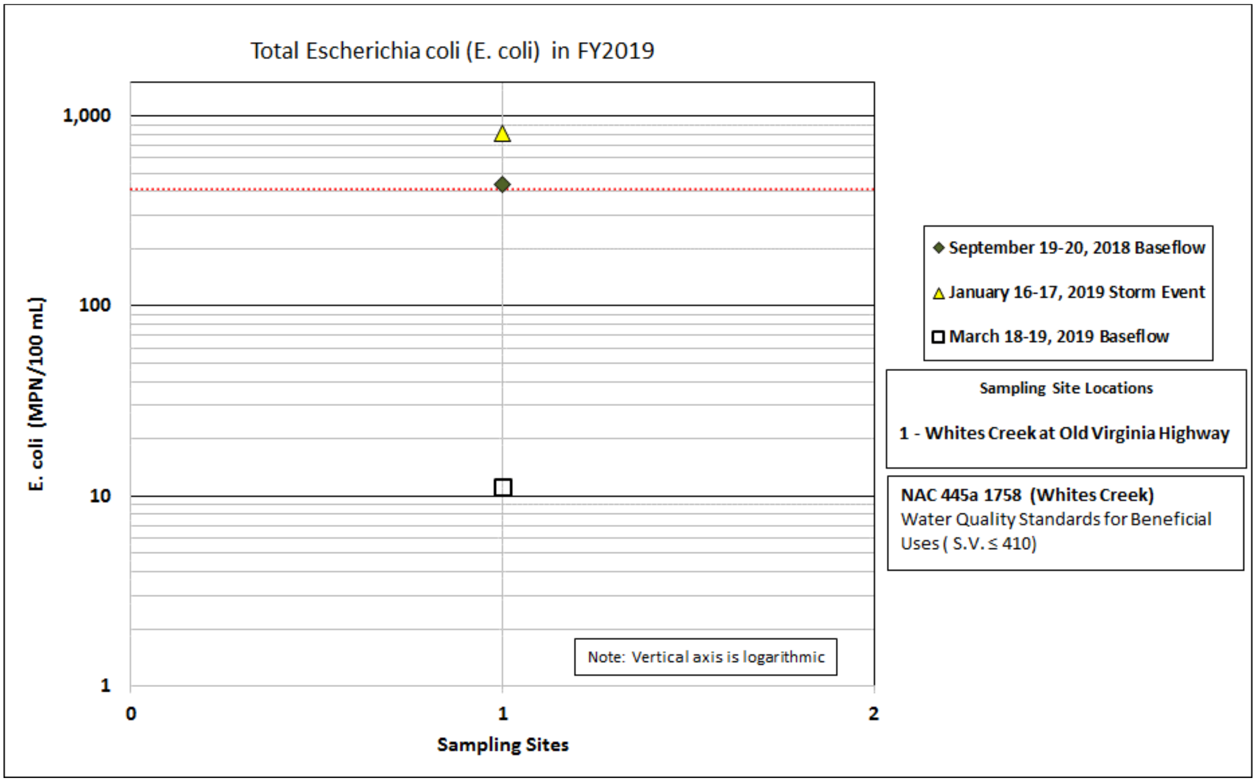


Figure 5-50 E. coli Counts for Samples Collected in Whites Creek, FY2019

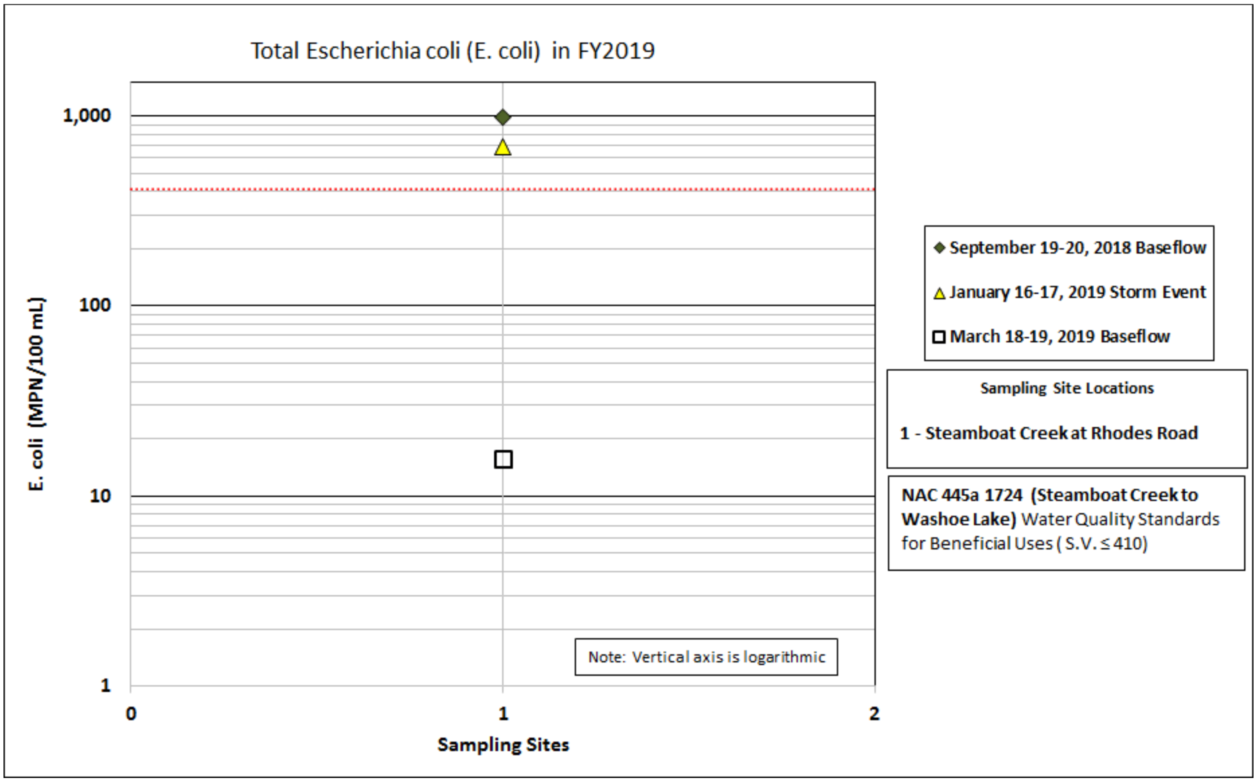


Figure 5-51 E. coli Counts for Samples Collected in Steamboat Creek, FY2019

5.4.5 PHYSICAL PARAMETERS: DISSOLVED OXYGEN, PH, SPECIFIC CONDUCTANCE AND TURBIDITY

Physical parameters of waters sampled are measured during each site visit (storm or non-storm conditions and when flow was present). In this section, we present physical parameters across all monitoring stations to provide greater context for water quality conditions throughout the monitoring year. NDEP (2014) recognizes that instantaneous measures of physical parameters are representative of a specific point in time and can naturally vary over a 24-hour period.

DO concentrations measured in FY2019 are shown in **Figure 5-52**, **Figure 5-53**, and **Figure 5-54**, grouped by their listed water body and specific numeric criterion for DO. In the Truckee River, WQS for DO vary depending on the time of year. In some tributaries, a fixed WQS value exists throughout the year and is shown where appropriate.

Higher DO concentrations may indicate super-saturated conditions attributed to rapid aeration and photosynthesis. During the process of photosynthesis, plants produce oxygen as a waste product. This adds to the DO concentration in the water, potentially increasing DO to values above 100 percent saturation (YSI, 2005). The actual concentration of DO will also vary depending on water temperature and salinity. First, the solubility of oxygen decreases as temperature increases. Second, dissolved oxygen decreases exponentially as salt levels increase (Wetzel, 2001). As such, we tend to see higher DO concentrations during winter when waters are colder and fresher from snowmelt runoff.

In general, DO concentrations can be used as a proxy for other constituents. For example, nitrate occurs readily in oxidizing conditions (higher DO concentrations), but ammonia occurs primarily in reducing conditions or the absence of DO.

DO concentrations ranged from 5.03 mg/L to as high as 22.1 mg/L (**Figure 5-52**). DO concentrations measured across all stations discharging to the Truckee River in FY2019 met the WQS to protect beneficial uses. Higher DO concentrations were measured during the winter months; whereas the lowest DO concentrations were measured during the summer and fall months. In general, Alum Creek exhibited the highest DO concentrations on average through the year. The highest concentrations were measured on North Truckee Drain during baseflow sampling in March 2019.

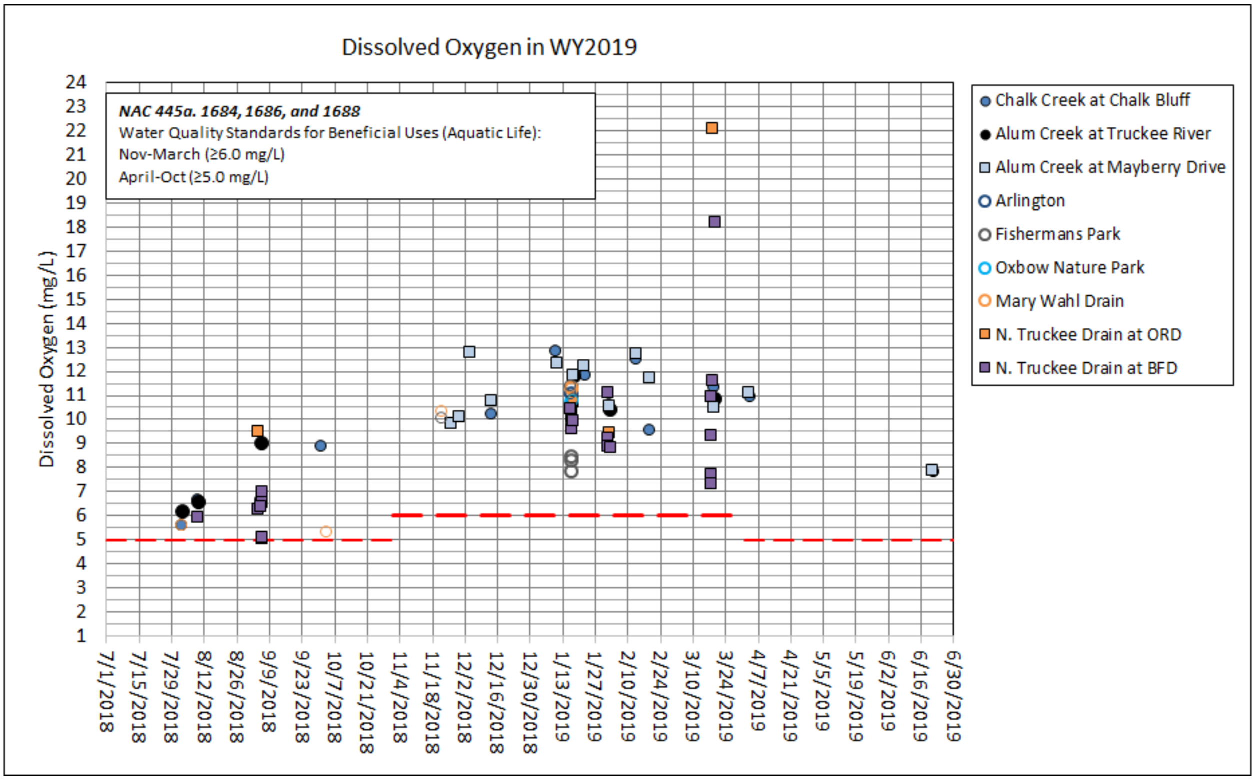


Figure 5-52 DO Concentrations for Tributaries and Stormwater Urban Outfalls to the Truckee River from Lockwood upstream to California/Nevada State Line, FY2019

DO concentrations measured in Steamboat Creek and tributaries downstream from Rhodes Road were measured across all stations between 5.1 mg/L and 18.0 mg/L (**Figure 5-53**), all above WQS established to protect beneficial uses (≥ 3 mg/L, below Rhodes Road to the Truckee River; ≥ 5 mg/L Rhodes Road upstream to the outlet of Washoe Lake). Measurements at Thomas Creek and Yori Drain both show consistently higher DO concentrations on average through the year, relative to the other stations compared. Supersaturated conditions in Yori Drain may be associated with outflows from the Yori mitigation wetlands located immediately upstream from the monitoring station. Conversely, measurements at Boynton Slough show a trend of lower DO concentrations relative to other stations compared in the Steamboat Creek watershed, this could be attributed to the land use in the watershed (high percent of urbanization).

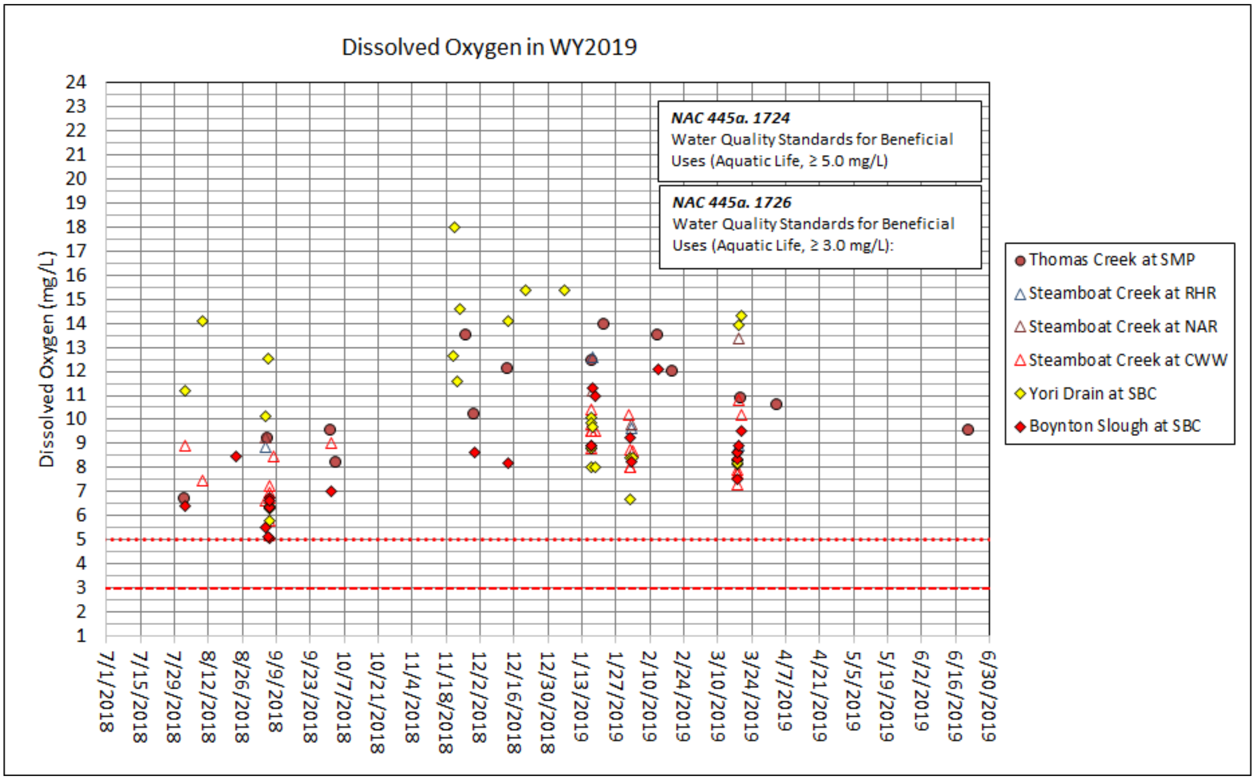


Figure 5-53 DO Concentrations for Steamboat Creek and Tributaries, FY2019

DO concentrations in Whites Creek were limited to 4 measurements and ranged from 9.7 mg/L to 13.1 mg/L (**Figure 5-54**), well above the WQS to protect beneficial uses (≥ 5.0 mg/L).

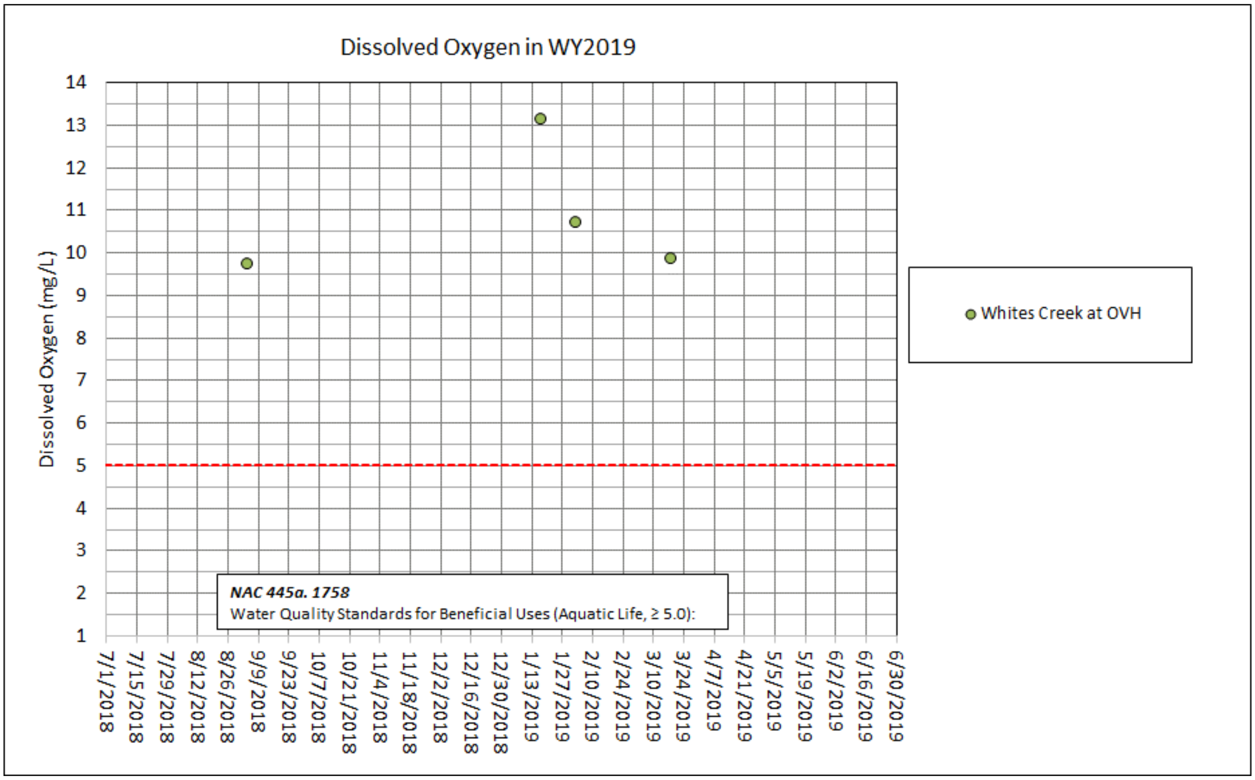


Figure 5-54 DO Concentrations for Whites Creek, FY2019

pH values measured throughout the Truckee Meadows in FY2019 from both storm samples and ambient samples as well as all site visits where measurements can be collected are shown in **Figure 5-55**, **Figure 5-56**, **Figure 5-57**, **Figure 5-58**, and **Figure 5-59**, grouped by their listed water body and specific numeric criterion for pH.

The pH ranged from 7.06 to as high as 8.93 across two tributaries and one stormwater urban outfall discharging to the Truckee River upstream of Idlewild in FY2019(**Figure 5-55**). All measures of pH met the WQS to protect beneficial uses, while only a few measures were slightly outside of the requirement to maintain existing higher quality.

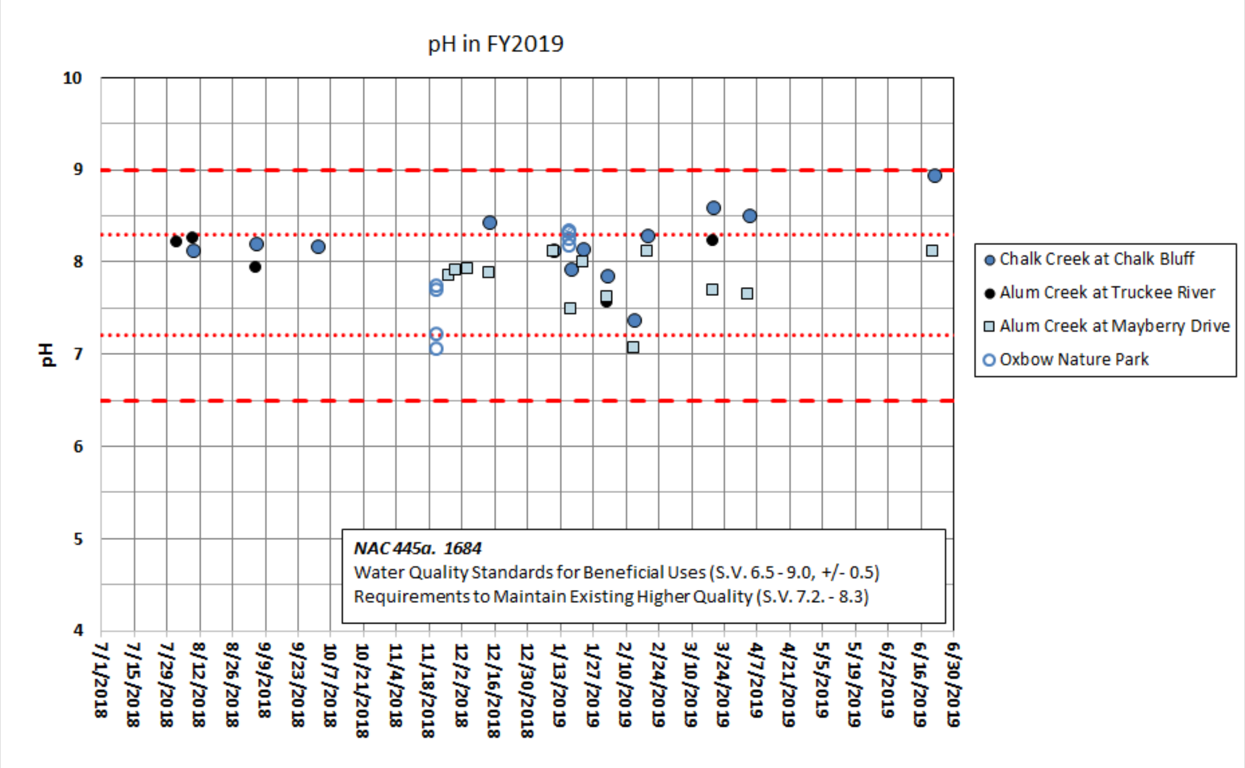


Figure 5-55 pH for Tributaries and Stormwater Urban Outfalls to the Truckee River upstream of Idlewild, FY2019

The pH ranged from 6.78 to as high as 8.45 across all three stormwater urban outfalls discharging to the Truckee River between E. McCarran and Idlewild in FY2019(**Figure 5-56**). Because these are stormwater urban outfalls, they typically only discharge during storm events; measures of pH are limited to stormwater samples only. All measurements of pH met the WQS to protect beneficial uses and most met the requirement to maintain existing higher quality.

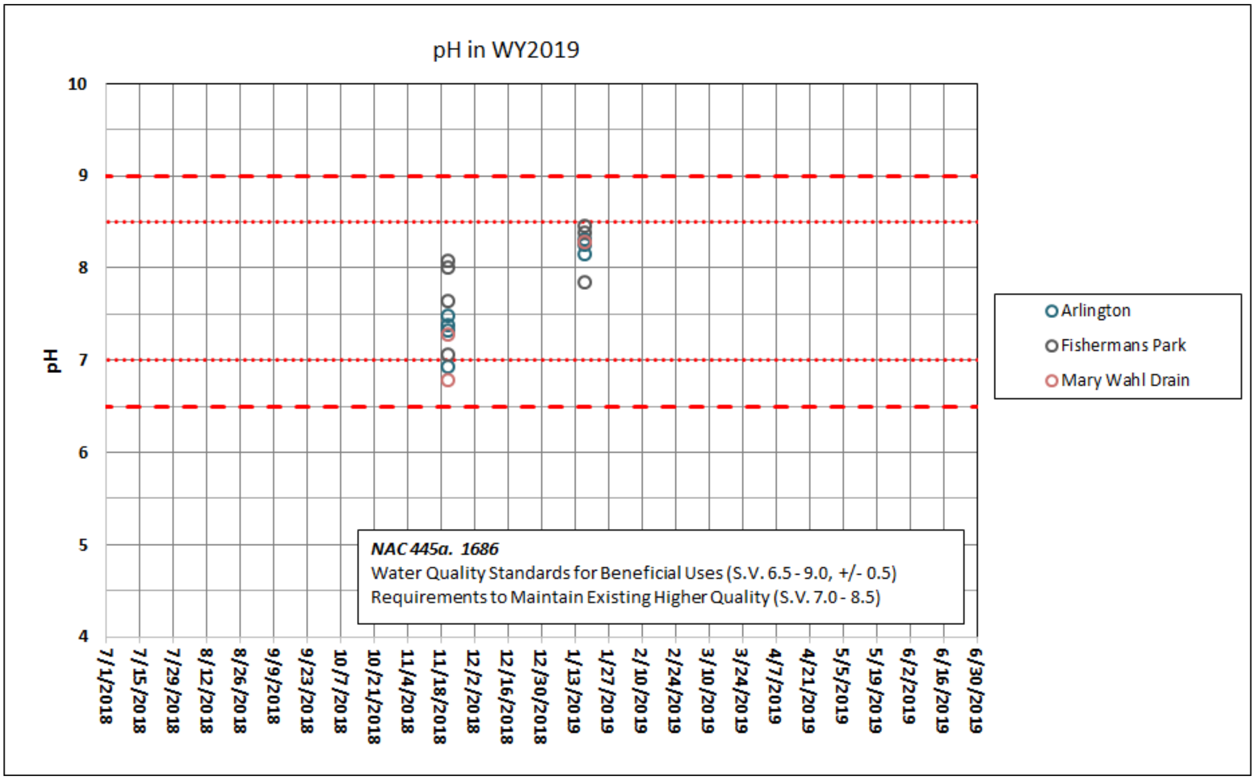


Figure 5-56 pH for Stormwater Urban Outfalls to the Truckee River from E. McCarran upstream to Idlewild, FY2019

The pH ranged from 7.92 to as high as 9.15 from two stations on North Truckee Drain in FY2019(**Figure 5-57**). All measures met the WQS to protect beneficial uses, except the winter baseflow measurement at Orr Ditch (9.15), and WQS to maintain higher quality, except for the winter baseflow measurement in North Truckee Drain at Big Fish Drive (9.00).

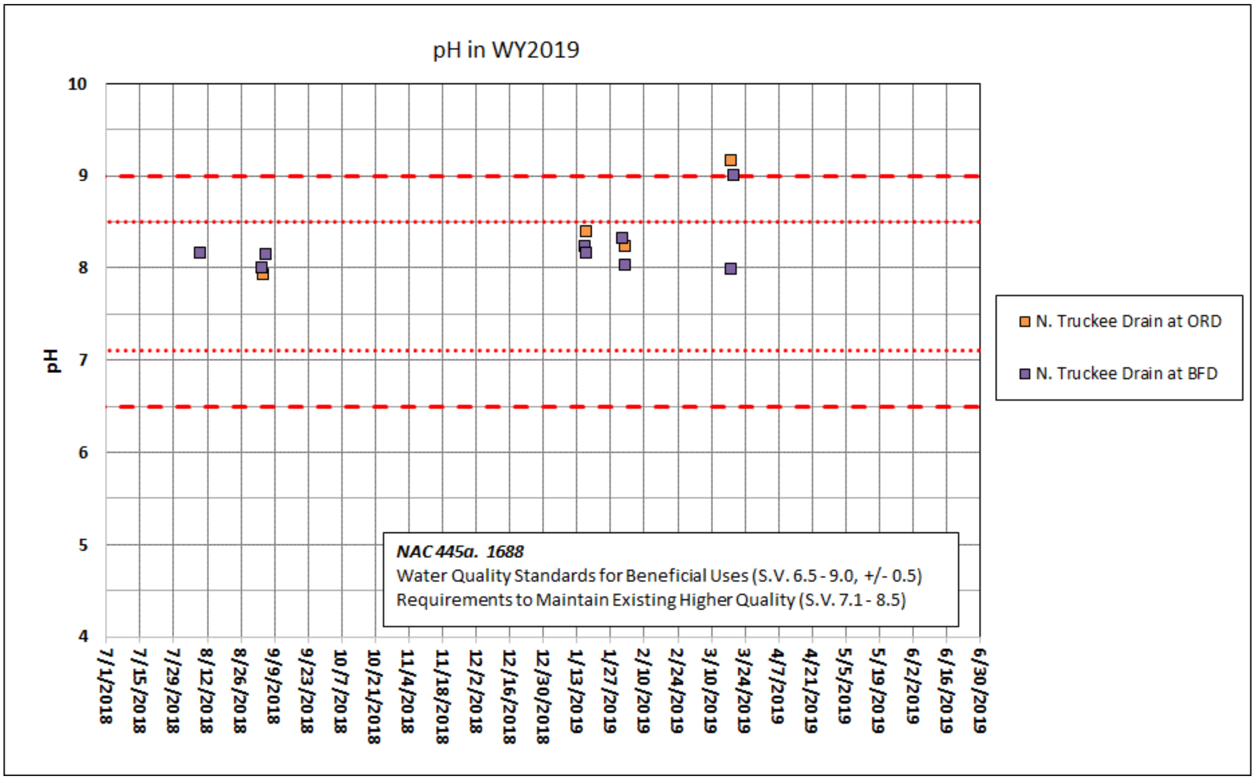


Figure 5-57 pH in the North Truckee Drain, FY2019

The pH measured in Steamboat Creek and tributaries downstream of Rhodes Road ranged between 7.45 and 9.42(**Figure 5-58**). Most measurements of pH were within WQS established to protect beneficial uses with the exception of measurements from Yori Drain during summer months that were consistently above 9.00. The highest measurement of pH was collected at Thomas Creek (9.42) in June 2019. In general, Yori Drain exhibited higher pH when compared to the other sampling locations, specifically in the summer months of 2018.

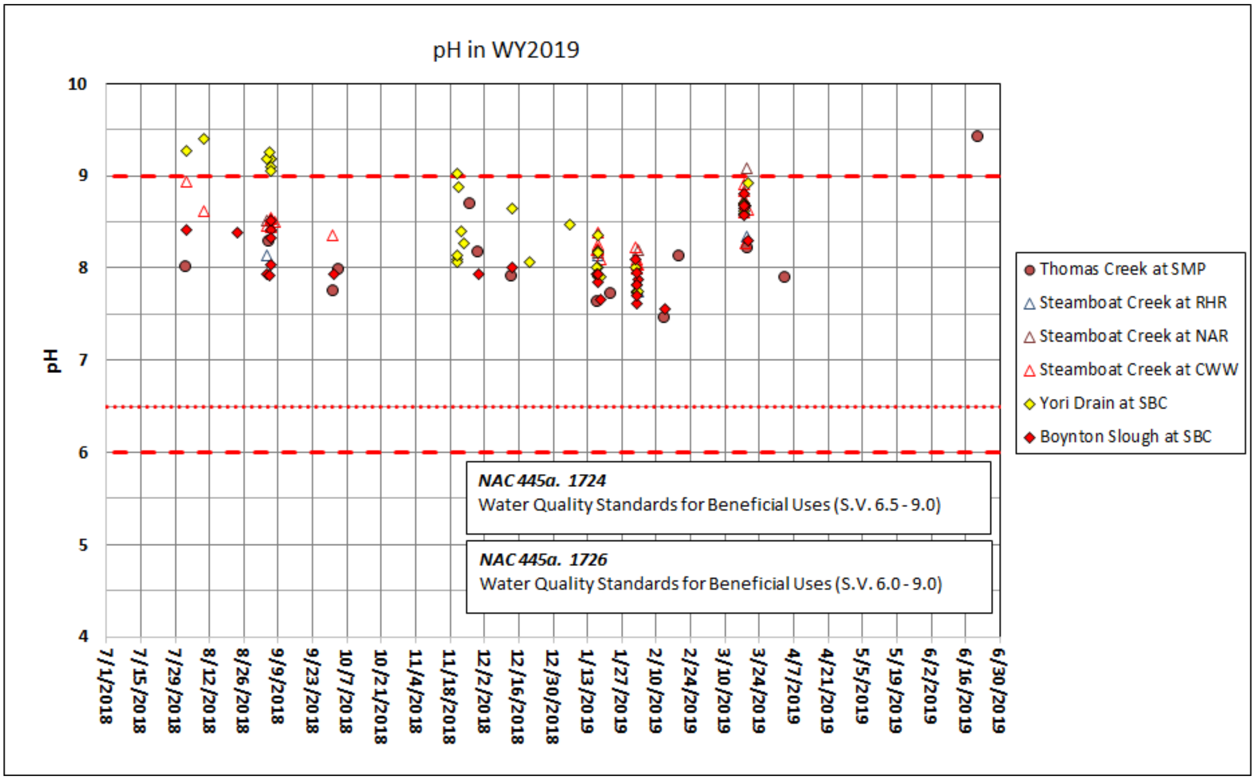


Figure 5-58 pH for Steamboat Creek and Tributaries, FY2019

The pH measured in Whites Creek ranged between 7.61 and 7.77(**Figure 5-59**), well within WQS established to protect beneficial uses in this tributary.

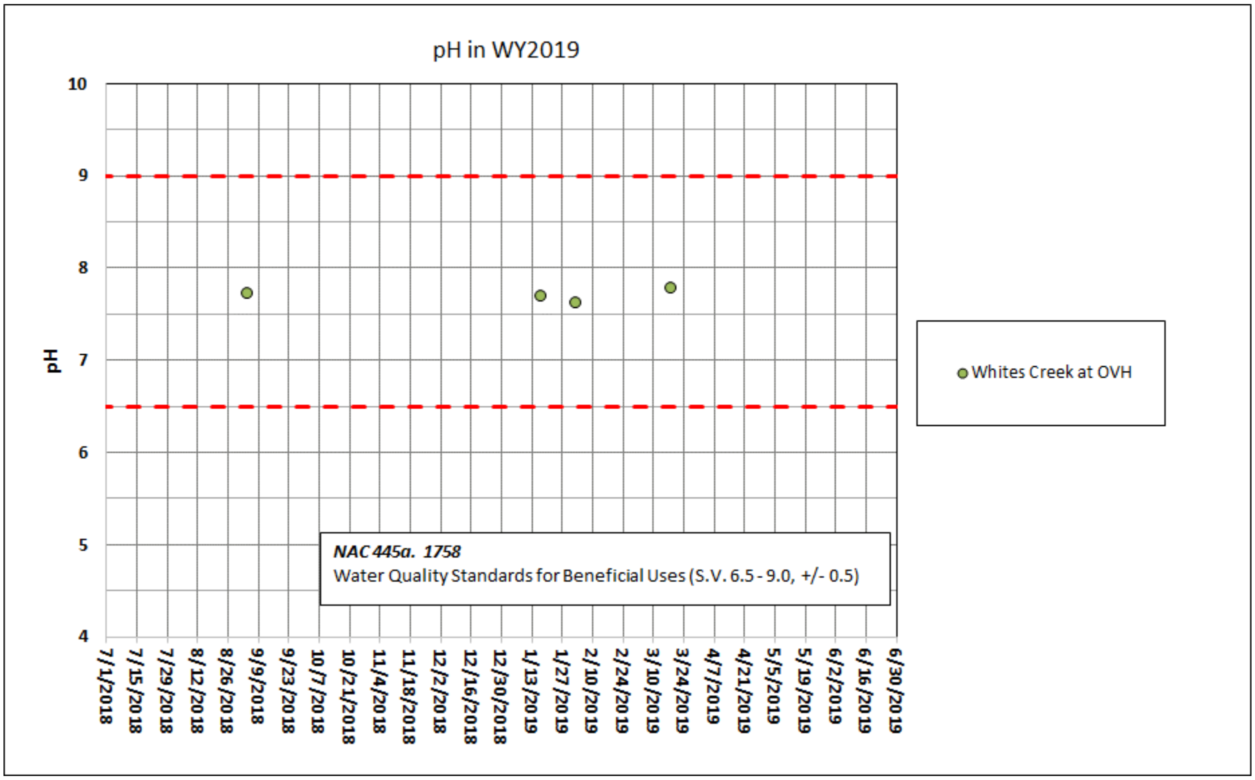


Figure 5-59 pH for Whites Creek, FY2019

Figure 5-60 compares Specific Conductance (SC), as a proxy for salinity, across all monitoring stations in the Truckee Meadows in FY2019. SC ranged between 36 µS (fresh water) and 3,428 µS (brackish water). Currently there are no WQS for SC in the Truckee Meadows.

Chalk Creek exhibited the highest values of SC consistently through the monitoring year and is consistent with previous years. Chalk Creek drains a watershed with geology and soils that can contribute to elevated specific conductance; therefore, elevated values are generally within the range expected for this creek. In general, groundwater also can dissolve more ions, so higher SC values in baseflow can indicate groundwater-supported baseflow. Such may be the case in Steamboat Creek where geothermal springs are present. Alternatively, irrigation return flows from the many ditches that discharge back to tributaries (i.e., North Truckee Drain, Steamboat Creek) may contain higher amounts of dissolved ions or salts and elevate SC in discharges to the Truckee River. Conversely, Whites Creek and Thomas Creek exhibit the lowest SC values. These watersheds originate in higher elevations with snowmelt hydrology. Snowmelt runoff typically exhibits very low SC values. Stormwater urban outfalls only discharge during a storm event; measures of SC are limited to stormwater samples only.

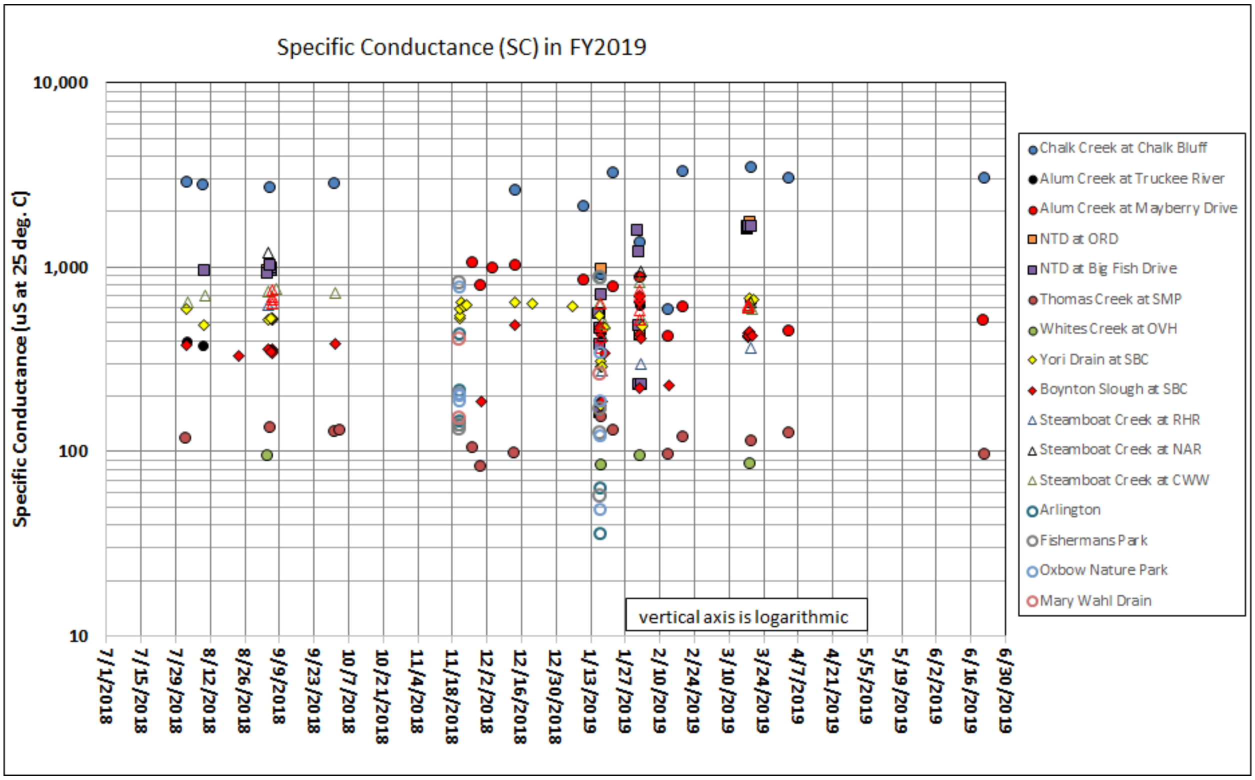


Figure 5-60 Specific Conductance (SC) Across all Stations, Truckee Meadows, FY2019

Figure 5-61 compares turbidity across all stations for samples collected in FY2019. Turbidity is a measure of water clarity and typically increases coincident with an increase in total suspended solids or sediments. The water quality standard for beneficial uses specifies turbidity to be equal to or less than 10 NTU (S.V.), except of Steamboat Creek and Whites Creek, where no turbidity WQS exists.

In FY2019, and in general, turbidity during baseflow conditions is typically lower than during storm events. Turbidity ranged between 5 NTU and 47 NTU during summer baseflow conditions and 4 NTU and 65 NTU during winter baseflow conditions. Both Steamboat Creek and Yori Drain exhibited the highest values during summer baseflow, and North Truckee Drain at Big Fish Drive showed highest values during winter baseflow. During storm events, most runoff samples exhibited turbidity values above the WQS with a range between 8 NTU and 415 NTU. The highest stormwater turbidity values were measured in Steamboat Creek at Narrows, Fisherman's Park II and North Truckee Drain at Big Fish Drive.

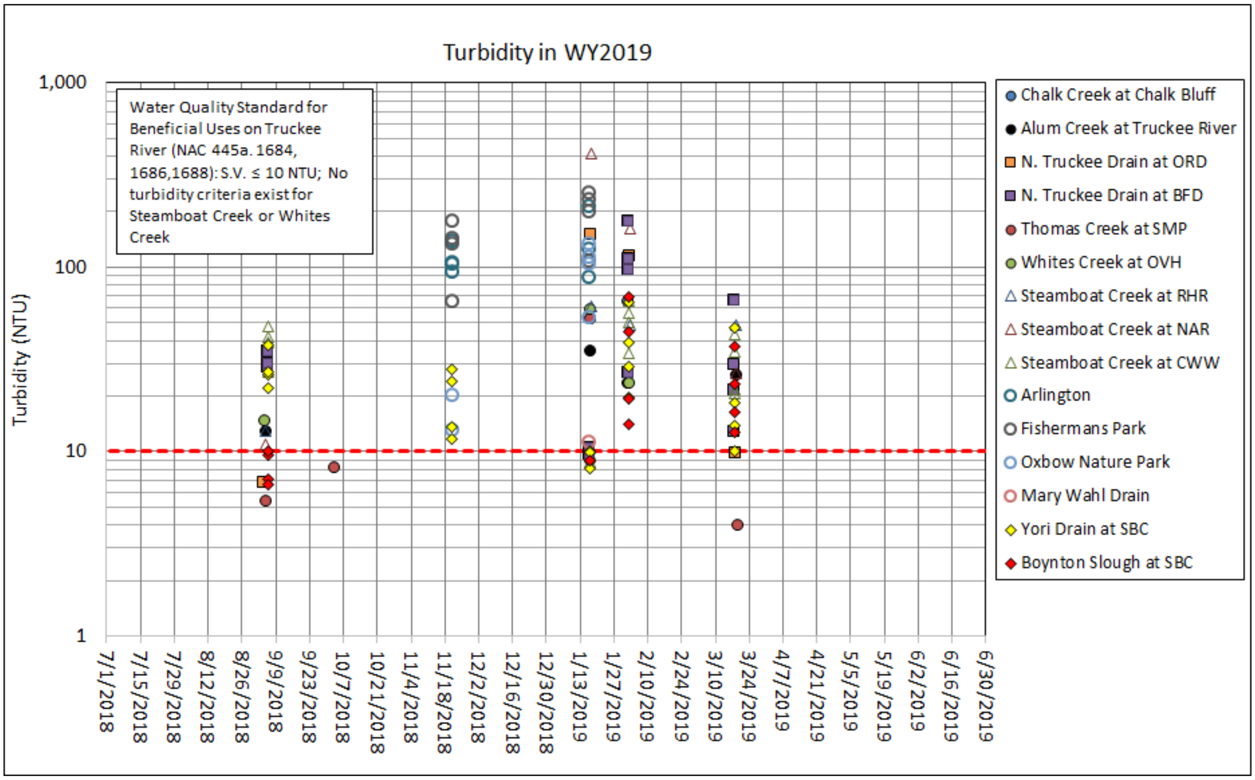


Figure 5-61 Turbidity Across all Stations, Truckee Meadows, FY2019 Stormwater and Baseflow samples

5.5 Storm event and Baseflow Instantaneous Loads

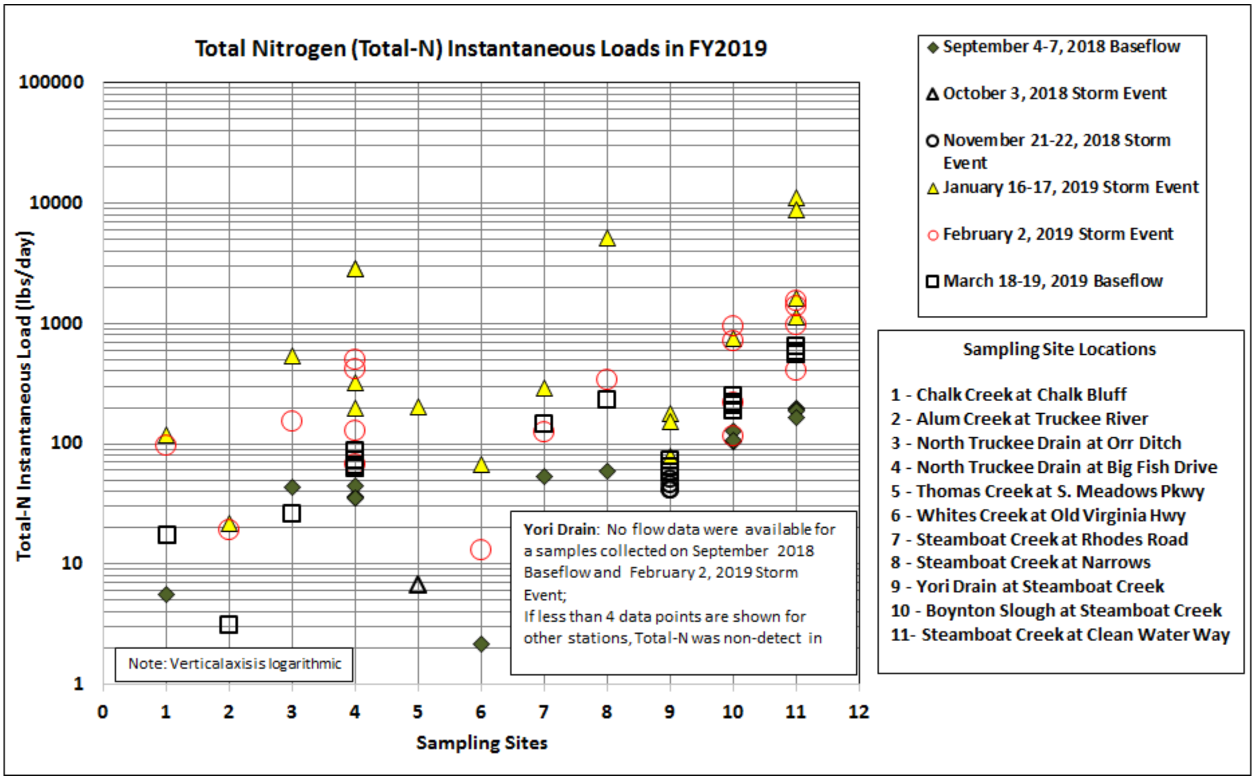
In this section, we compare instantaneous loads for a limited number of constituents (Total-N, Total-P, and TDS) across tributary sites where grab samples and instantaneous flow were measured simultaneously in both storm events and baseflow conditions and absent of multiple, automated sample collection. Instantaneous loads can be calculated using both a measure of instantaneous flow and the constituent concentration analyzed from a grab sample. While these measures are “snapshots” in time they provide additional information other than the concentration alone. For example, instantaneous loads are commonly reported in lbs./day, similar to TMDLs, such that relative comparisons can be made.

Standard reporting for instantaneous load is mass per time (e.g., lbs./day). In some cases, instantaneous loading rates for some tributary sites were not calculated because constituents were not detected above laboratory detection limits.

Once again, note that decreases in water quality are expected in high runoff events. Concentration values that exceed WQS do not necessarily reflect overall waterbody annual water quality. High concentration values coupled with high flows will result in high instantaneous load values.

5.5.1 TOTAL-N INSTANTANEOUS LOADS

Figure 5-62 compares instantaneous loads for Total-N at all tributary sites as measured in FY2019. Instantaneous loads from storm water ranged from 13 lbs./day to 11,194 lbs./day across all stations and across all storm samples collected at each station. Instantaneous loads from baseflow samples ranged from 2 lbs./day to 645 lbs./day across all stations and across all baseflow samples collected at each station. Overall, the highest instantaneous Total-N loads were measured during the January 2019 storm event. This event was a significant storm and samples were collected at all monitoring stations. Summer baseflow samples indicated lower loading rates than winter baseflow samples with the exception of North Truckee Drain at Orr Ditch.



Yori Drain: No flow data were available for a samples collected on September 2018 Baseflow and February 2, 2019 Storm Event;
If less than 4 data points are shown for other stations, Total-N was non-detect in

Figure 5-62 Total Nitrogen (Total-N) Instantaneous Loads Across Tributary Sites in Truckee Meadows, FY2019

5.5.2 TOTAL-P INSTANTANEOUS LOADS

Figure 5-63 compares Total-P instantaneous loads across all tributary sites where measured in FY2019. Instantaneous loads from storm water ranged from 1.25 lbs./day to 1,247 lbs./day across all stations and across all storm samples collected at each station. Instantaneous loads from baseflow samples ranged from 0.15 lbs./day to 114 lbs./day across all stations and across all baseflow samples collected at each station. Similarly, to Total-N, the highest instantaneous Total-P loads were measured during the January 2019 storm event. In general Steamboat Creek exhibited the highest loads with similar ranges from the upstream location of The Narrows (SBC@NAR) to the furthest downstream location at Clean Water Way (SBC@CWW).

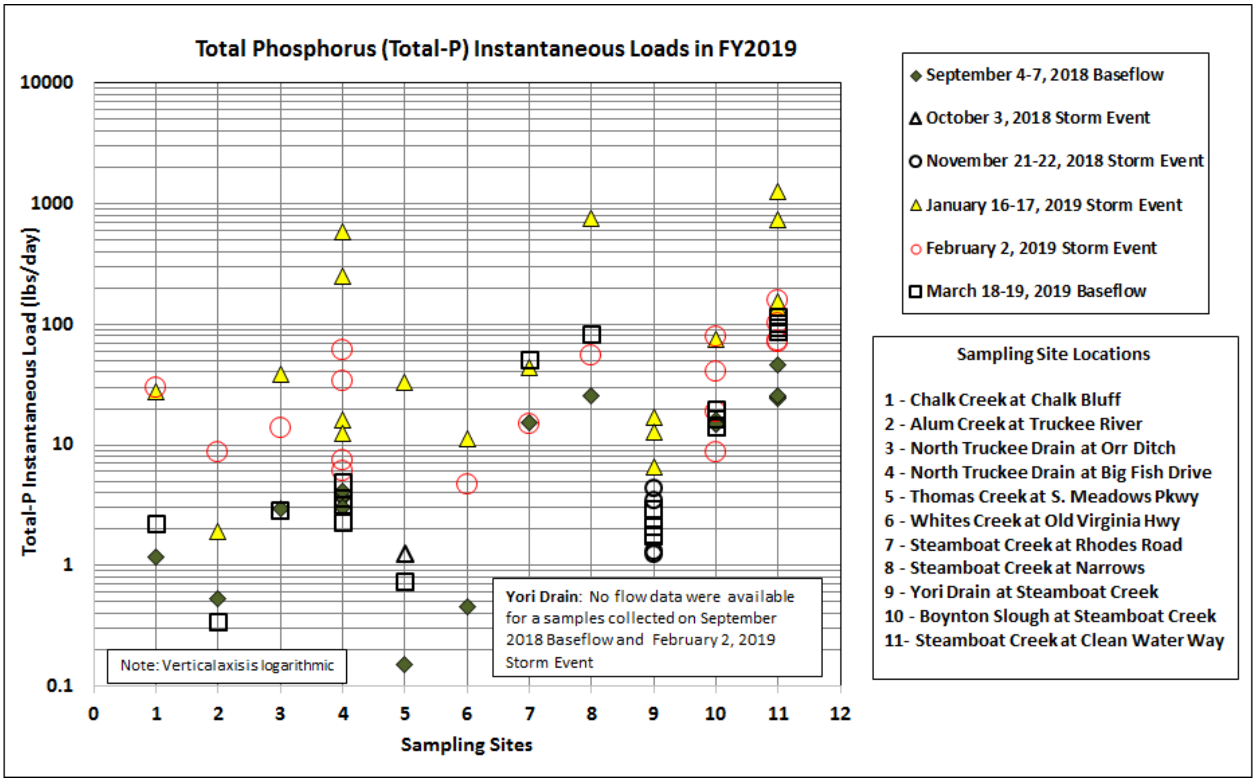


Figure 5-63 Total Phosphorus (Total-P) Instantaneous Loads Across Tributary Sites in Truckee Meadows, FY2019

5.5.3 TDS INSTANTANEOUS LOADS

Figure 5-64 compares instantaneous loads for TDS across tributary sites measured in FY2019. Instantaneous loads from storm water ranged from 743 lbs./day to 863,571 lbs./day across all stations and across all storm samples collected at each station. Instantaneous loads from baseflow samples ranged from 147 lbs./day to 174,580 lbs./day across all stations and across all baseflow samples collected at each station. Again, the highest instantaneous TDS loads were measured during the January 2019 storm event. Similarly, to Total-N and Total-P, Steamboat Creek exhibited the highest loads with comparable ranges from the upstream location of The Narrows (SBC@NAR) to the furthest downstream location at Clean Water Way (SBC@CWW).

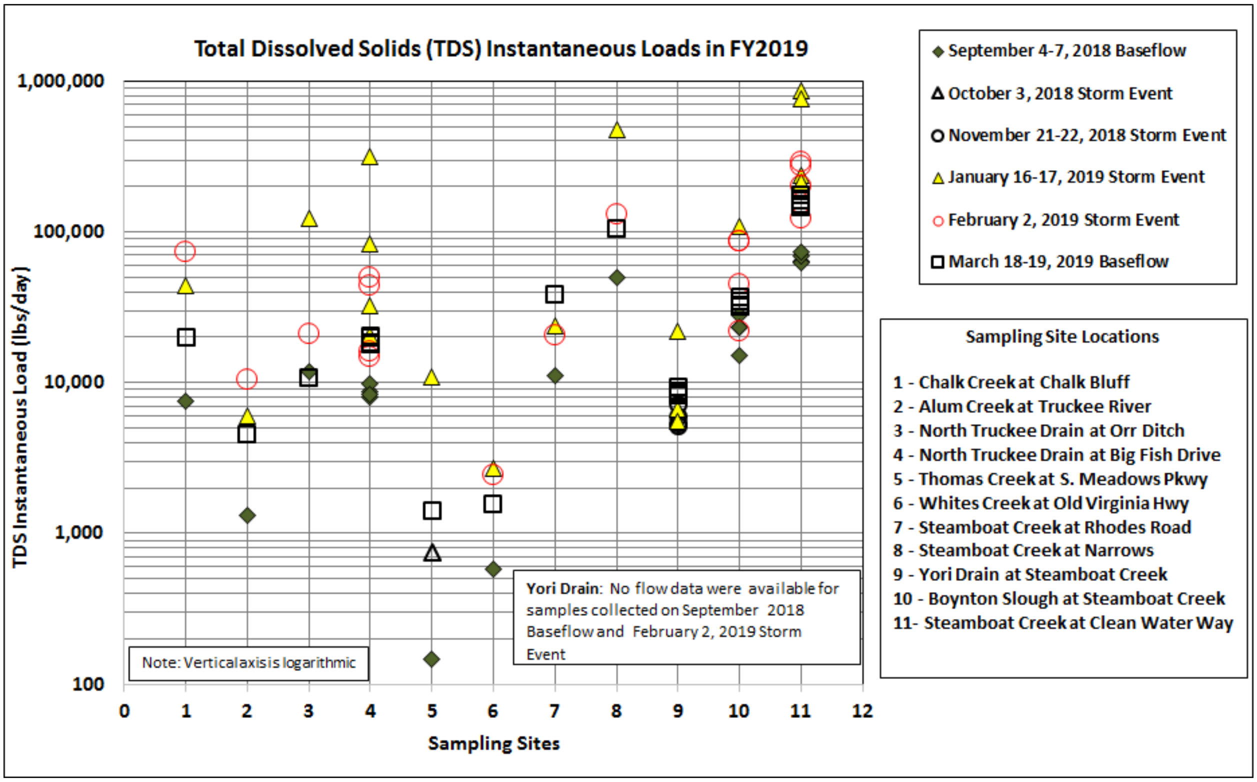


Figure 5-64 Total Dissolved Solids (TDS) Instantaneous Loads Across Tributary Sites in Truckee Meadows, FY2019

5.6 Storm Event and Baseflow Constituent Loads

Automated sampling was conducted during 2 storm events and 2, 24-hour baseflow periods (see Table 5-1)

Storm event and baseflow loads and yields are presented in subsequent tables. Runoff volumes and load calculations are provided for both the total storm and for distinct segments of the storm hydrograph to show variability in loads, directly related to variability in constituent concentrations and runoff volumes measured in each hydrograph segment. Yields are presented for each constituent across all stations compared and are calculated by dividing the total storm load by the station contributing area.

Total storm event runoff, loads, and yields measured at three urban outfalls and at Yori Drain from the November 21-22, 2018 storm event are presented in **Table 5-3**, This event was a smaller frontal storm. Total storm rainfall was 0.31 inches at the Reno-Tahoe International Airport. Runoff volumes and load calculations are provided for both the total storm and for distinct segments of the hydrograph to show variability in loading during the storm. Yields are presented for each constituent across all stations and are calculated by dividing the total load by the contributing area. Both loads and yields for this event were relatively minor compared to other storms.

Table 5-3 Constituent Loads and Runoff Volumes for Three Urban Outfalls and Yori Drain, November 21-22, 2018 Storm Event

Oxbow Nature Park								
		Storm Loads						
Hydrograph	Storm Runoff Volume	Total-N	NO_3	TKN	Total-P	Ortho-P	TDS	TSS
	(cubic feet)	*(lbs)*						
First Flush	2,439	3.5	0.40	3.2	0.2	0.1	148	93
Rising Limb	2,919	0.7	0.11	0.6	0.2	0.1	35	5
Peak	4,973	0.8	0.14	0.7	0.1	0.1	50	4
Falling Limb	22,751	6.1	0.98	5.1	1.4	0.3	298	108
Totals	**33,082**	**11**	**1.6**	**10**	**1.9**	**0.7**	**530**	**210**
	(cf/sq. mi)	*(lbs./sq. mi)*						
Yields	**91,894**	**31**	**4.5**	**27**	**5.3**	**1.8**	**1473**	**582**

Fisherman's Park II								
		Storm Loads						
Hydrograph	Storm Runoff Volume	Total-N	NO_3	TKN	Total-P	Ortho-P	TDS	TSS
	(cubic feet)	*(lbs)*						
First Flush	16,330	24	4.8	19	2	0.7	887	234
Rising Limb	23,082	11	1.2	9	3	0.5	259	720
Peak	11,099	3	0.4	3	1	0.3	76	215
Falling Limb	47,765	12	2.0	10	2	1.1	328	274
Totals	**98,276**	***51***	***8.4***	***42***	***9.0***	***2.6***	***1,550***	***1,444***
	(cf/sq. mi)	*(lbs./sq. mi)*						
Yields	**19,270**	***9.9***	***1.7***	***8.3***	***1.8***	***0.5***	***304***	***283***

Arlington								
		Storm Loads						
Hydrograph	Storm Runoff Volume	Total-N	NO_3	TKN	Total-P	Ortho-P	TDS	TSS
	(cubic feet)	*(lbs)*						
First Flush	2,754	2.1	0.29	1.9	0.8	0.22	172	95
Rising Limb	7,718	2.5	0.34	2.1	0.7	0.23	36	116
Peak	784	0.3	0.04	0.2	0.1	0.04	11	12
Falling Limb	4,598	2.1	0.32	1.8	0.7	0.29	112	72
Totals	**15,854**	**7**	**1**	**6**	**2.2**	**0.8**	**331**	**294**
	(cf/sq. mi)	*(lbs./sq. mi)*						
Yields	**49,543**	**22**	**3.1**	**19**	**7.0**	**2.4**	**1034**	**919**
		(lbs.)						
TOTALS 3 URBAN OUTFALLS		**69**	**11**	**58**	**13**	**4.0**	**2,412**	**1,948**

Table 5-3 (cont.)

Yori Drain at Steamboat Creek								
		Storm Loads						
Hydrograph	Storm Runoff Volume	Total-N	NO_3	TKN	Total-P	Ortho-P	TDS	TSS
	(cubic feet)	*(lbs)*						
First Flush	5,986	1.1	0.6	0.6	0.1	0.03	112	24
Rising Limb	28,022	4.4	2.4	1.9	0.3	0.10	507	49
Peak	17,440	2.4	1.5	0.9	0.1	0.03	338	26
Falling Limb	101,081	13	8.8	4.7	0.4	0.13	2,272	189
Totals	**152,528**	**21**	**13**	**8**	**1**	**0.3**	**3,229**	**289**
	(cf/sq. mi)	*(lbs./sq. mi)*						
Yields	**36,316**	**5.0**	**3.2**	**1.9**	**0.2**	**0.1**	**769**	**69**
TOTAL LOADS FROM 1 TRIBUTARY		**21**	**13**	**8**	**1**	**0.3**	**3,229**	**289**
TOTAL LOADS		**90**	**24**	**66**	**14**	**4**	**5,640**	**2,237**

Notes:

Yields are estimates based on the contributing areas provided by City of Reno, City of Sparks, USGS or other entity.

Total storm loads and yields measured from three urban outfalls and two tributary stations during the January 16-17, 2019 storm event are compared in **Table 5-4**. This event was a significant winter frontal storm with over 1.5 inches of rainfall measured at the Reno-Tahoe International Airport. Total-P and TDS loads were higher at Arlington than Oxbow Park, both having comparable watershed areas. Specifically, TDS loads were 5 times greater at Arlington. Loads in the tributaries are roughly proportional compared to the volume of runoff.

Table 5-4 Constituent Loads and Runoff Volumes for Three Urban Outfalls and Two Tributaries, January 16-17, 2019

Oxbow Nature Park								
		Storm Loads						
Hydrograph	Storm Runoff Volume	Total-N	NO$_3$	TKN	Total-P	Ortho-P	TDS	TSS
	(cubic feet)	*(lbs)*						
First Flush	46,654	4.1	0.6	3.5	0.8	0.3	524	437
Rising Limb	33,558	2.9	0.4	2.5	0.4	0.2	0	335
Peak	117,712	9.6	1.1	8.8	0.8	0.8	198	1543
Falling Limb	86,451	11	4.8	5.9	1.6	1.2	594	119
Totals	**284,375**	**27**	**7.0**	**21**	**3.5**	**2.6**	**1,316**	**2434**
	(cf/sq. mi)	*(lbs./sq. mi)*						
Yields	**789,931**	**76**	**19.4**	**58**	**9.9**	**7.3**	**3656**	**6761**

Fisherman's Park II								
		Storm Loads						
Hydrograph	Storm Runoff Volume	Total-N	NO$_3$	TKN	Total-P	Ortho-P	TDS	TSS
	(cubic feet)	*(lbs)*						
First Flush	53,469	8	1.2	6	2	0.5	1,569	601
Rising Limb	161,780	19	2.6	16	5	1.7	636	3,131
Peak	185,882	26	2.0	23	5	2.0	302	4,990
Falling Limb	236,649	27	8.9	18	4	4.4	2,068	340
Totals	**637,780**	***79***	***14.7***	***63***	***15.4***	***8.6***	***4,575***	***9,061***
	(cf/sq. mi)	*(lbs./sq. mi)*						
Yields	**125,055**	***15.5***	***2.9***	***12.4***	***3.0***	***1.7***	***897***	***1777***

Arlington								
		Storm Loads						
Hydrograph	Storm Runoff Volume	Total-N	NO$_3$	TKN	Total-P	Ortho-P	TDS	TSS
	(cubic feet)	*(lbs)*						
First Flush	232,216	25	3.5	22	7.4	1.9	6,958	1,740
Rising Limb	78,924	11	0.5	10	1.1	0.7	118	1,182
Peak	7,185	0.6	0.1	0.6	0.2	0.1	8.1	67
Falling Limb	--	--	--	--	--	--	--	--
Totals	**318,325**	**36**	**4**	**33**	**8.7**	**2.6**	**7,085**	**2,989**
	(cf/sq. mi)	*(lbs./sq. mi)*						
Yields	**994,764**	**113**	**12.6**	**102**	**27.2**	**8.2**	**22140**	**9342**
		(lbs.)						
TOTALS 3 URBAN OUTFALLS		**142**	**26**	**117**	**28**	**13.9**	**12,976**	**14,485**

Table 5-4(cont.)

North Truckee Drain at Big Fish Drive

		Storm Loads						
Hydrograph	Storm Runoff Volume	Total-N	NO_3	TKN	Total-P	Ortho-P	TDS	TSS
	(cubic feet)	*(lbs)*						
First Flush	559,323	105	21	84	5.2	3.8	10,475	1,641
Rising Limb	594,900	71	19	52	4.5	4.5	7,428	4,457
Peak	1,968,300	270	36	233	55	15	7,987	28,261
Falling Limb	6,060,870	984	291	681	87	98	109,726	90,807
Totals	**9,183,393**	**1,429**	**366**	**1,050**	**152**	**121.4**	**135,615**	**125,166**
	(cf/sq. mi)	*(lbs./sq. mi)*						
Yields	**91,834**	**14.3**	**3.7**	**10.5**	**1.5**	**1.2**	**1356**	**1252**

Steamboat Creek at Clean Water Way

		Storm Loads						
Hydrograph	Storm Runoff Volume	Total-N	NO_3	TKN	Total-P	Ortho-P	TDS	TSS
	(cubic feet)	*(lbs)*						
First Flush	2,490,390	264	129	143	33	17	55,969	10,572
Rising Limb	6,854,400	899	227	685	86	60	119,813	119,813
Peak	20,997,000	4588	944	3670	511	406	353,912	891,335
Falling Limb	35,248,500	6161	1936	4181	506	682	528,113	572,122
Totals	**65,590,290**	**11,912**	**3236**	**8,679**	**1136**	**1165.5**	**1,057,806**	**1,593,841**
	(cf/sq. mi)	*(lbs./sq. mi)*						
Yields	**268,813**	**119.1**	**32.4**	**86.8**	**11.4**	**11.7**	**10578**	**15938**

TOTAL LOADS FROM 2 TRIBUTARIES	**13,341**	**3,602**	**9,729**	**1,288**	**1,287**	**1,193,421**	**1,719,008**
TOTAL LOADS	**13,484**	**3,628**	**9,846**	**1,315**	**1,301**	**1,206,397**	**1,733,492**

Notes:

Loads and yields are not reported for Yori Drain due to backwatering from Steamboat Creek affecting the flow record.

Yields are estimates based on the contributing areas provided by City of Reno, City of Sparks, USGS or other entity.

Watershed area North Truckee Drain at Big Fish Drive is roughly estimated due to complexity of irrigation network and urban drainage areas

Total storm loads and yields measured for the first wave of a moderate frontal storm on February 2, 2019 are presented in **Table 5-5**, for North Truckee Drain at Big Fish Drive, Steamboat Creek and Boynton Slough, which is a tributary to Steamboat Creek. Total storm rainfall was 0.46 inches at the Reno-Tahoe International Airport. Yori Drain, a secondary tributary to Steamboat Creek, was sampled but equipment issues prevented the collection of flow data to calculate loads. Concentrations from this storm at Yori Drain are previously presented in this report.

Boynton Slough is a large tributary to Steamboat Creek. While Total-N and Total-P loads are roughly twice as much in Steamboat Creek compared to Boynton Slough from the storm, TDS loads are four times greater. For further comparison purposes, we discuss yield values reported in **Table 5-5**. Between the two tributaries, TDS yields for Boynton Slough were greater (1384 lbs./sq. mile) than Steamboat (1127 lbs./sq. mile). In comparison, North Truckee Drain yields of TDS were 252 lbs./sq. mile during the same storm.

Table 5-5 Constituent Loads and Runoff Volumes at North Truckee Drain, Steamboat Creek and Boynton Slough, February 2, 2019

Boynton Slough at Steamboat Creek								
		Storm Loads						
Hydrograph	Storm Runoff Volume	Total-N	NO_3	TKN	Total-P	Ortho-P	TDS	TSS
	(cubic feet)	*(lbs)*						
First Flush	120,034	*16*	*13*	*3.8*	*1.2*	*0.7*	*2,997*	*217*
Rising Limb	632,182	*79*	*67*	*19*	*6.7*	*3.7*	*16,181*	*789*
Peak	1,008,973	*132*	*69*	*59*	*7.6*	*5.3*	*16,377*	*5,417*
Falling Limb	4,211,132	*342*	*158*	*208*	*29*	*24*	*31,547*	*28,918*
Totals	***5,972,322***	***569***	***307***	***289***	***44***	***33***	***67,102***	***35,341***
	(cf/sq. mi)	*(lbs./sq. mi)*						
Yields	***114,852***	***11***	***6***	***6***	***0.9***	***0.6***	***1290***	***680***

Steamboat Creek at Clean Water Way								
		Storm Loads						
Hydrograph	Storm Runoff Volume	Total-N	NO_3	TKN	Total-P	Ortho-P	TDS	TSS
	(cubic feet)	*(lbs)*						
First Flush	1,591,290	*149*	*84*	*74*	*26*	*12*	*44,703*	*5,166*
Rising Limb	777,420	*97*	*58*	*43*	*7.3*	*4.9*	*20,384*	*4,756*
Peak	1,608,300	*201*	*120*	*84*	*21*	*8.7*	*36,145*	*11,044*
Falling Limb	8,699,580	*815*	*489*	*386*	*60*	*54*	*173,789*	*43,447*
Totals	***12,676,590***	***1262***	***752***	***587***	***114***	***79***	***275,020***	***64,413***
	(cf/sq. mi)	*(lbs./sq. mi)*						
Yields	***51,953***	***5***	***3***	***2***	***0.5***	***0.3***	***1127***	***264***

North Truckee Drain at Big Fish Drive								
		Storm Loads						
Hydrograph	Storm Runoff Volume	Total-N	NO_3	TKN	Total-P	Ortho-P	TDS	TSS
	(cubic feet)	*(lbs)*						
First Flush	*212,778*	*44*	*31*	*15*	*4.0*	*2.4*	*9,697*	*359*
Rising Limb	*304,020*	*42*	*17*	*27*	*2.5*	*1.7*	*5,314*	*2,657*
Peak	*256,410*	*26*	*8.0*	*18*	*1.8*	*1.5*	*2,561*	*2,241*
Falling Limb	*759,681*	*71*	*21*	*52*	*10*	*5.2*	*7,588*	*7,588*
Totals	***1,532,889***	***182***	***76***	***111***	***19***	***11***	***25,160***	***12,845***
	(cf/sq. mi)	*(lbs./sq. mi)*						
Yields	***15,329***	***2***	***0.8***	***1***	***0.2***	***0.1***	***252***	***128***
TOTAL LOADS FROM 3 TRIBUTARIES		**2,013**	**1,135**	**987**	**177**	**123**	**367,282**	**112,599**

Notes:

Loads and yields are not reported for Yori Drain due to instrument error and lack of flow record.

Yields are estimates based on the contributing areas provided by City of Reno, City of Sparks, USGS or other entity.

Watershed area North Truckee Drain at Big Fish Drive is roughly estimated due to complexity of irrigation network and urban drainage areas

5.6.1 Baseflow Loads (24-Hours) from Steamboat Creek, Yori Drain, Boynton Slough and North Truckee Drain

Baseflow or non-storm constituent loads and yields were evaluated in Steamboat Creek at Clean Water Way and North Truckee Drain at Big Fish Drive in the summer (September 2018) and the winter (March 2019) of FY2019.

Yori Drain and Boynton Slough were also sampled for baseflow in March 2019 despite having challenges with data collection. The Yori Drain site experienced equipment failure during summer baseflow, and no flow data was collected while Boynton Slough was not instrumented until October 2018, however some data was generated. Baseflow sample collection began at mid-day, September 4, 2018 and March 18, 2019, and continued hourly until mid-day on September 5, 2018 and March 19, 2019 to address specific questions. Samples were composited into 4 groups to represent: (1) afternoon (12:00 – 17:00); (2) evening (18:00 – 23:00); (3) early morning (0:00 – 5:00); and (4) late morning (6:00 – 11:00) water quality and loads. Boynton Slough and Yori Drain were started at 13:00 and 14:00 respectively—composite samples were separated in 6 hour increments as above). Loads were calculated for each period and at each station. Yields are provided for each station across all constituents.

Summer baseflow loads and yields for Steamboat Creek at Clean Water Way and North Truckee Drain are presented in **Table 5-6**. Steamboat Creek baseflow averaged 31 cfs during the 24-hour period we studied. Under these summer baseflow conditions, Total-N loads from Steamboat Creek were measured to be 186 lbs, Total-P loads were measured to be 30 lbs, and TDS loads were measured to be 67,512 lbs. North Truckee Drain baseflow averaged 2.9 cfs during the 24-hour period we studied. Under these summer baseflow conditions, Total-N loads from North Truckee Drain were measured to be 38 lbs, Total-P loads were measured to be 3 lbs, and TDS loads were measured to be 8,877 lbs.

Table 5-6 Summer Baseflow Volumes and Constituent Loads for Steamboat Creek and North Truckee Drain, September 4-7, 2018

Steamboat Creek at Clean Water Way								
		Baseflow Loads						
Hydrograph	Storm Runoff Volume	Total-N	NO_3	TKN	Total-P	Ortho-P	TDS	TSS
	(cubic feet)	*(lbs)*						
Afternoon	680,940	*51*	*8.1*	*42*	*6.4*	*6.4*	*16,579*	*3,061*
Evening	691,740	*48*	*9.1*	*37*	*6.0*	*6.0*	*15,546*	*2,893*
Early Morning	668,790	*46*	*8.4*	*37*	*6.3*	*8.4*	*16,700*	*3,215*
Late Morning	665,190	*42*	*8.3*	*34*	*12*	*7.9*	*18,687*	*1,536*
Totals	***2,706,660***	***186***	***34***	***150***	***30***	***29***	***67,512***	***10,705***
	(cf/sq. mi)	*(lbs./sq. mi)*						
Yields	***11,093***	***0.8***	***0.1***	***0.6***	***0.1***	***0.1***	***277***	***44***

North Truckee Drain at Big Fish Drive								
		Baseflow Loads						
Hydrograph	Storm Runoff Volume	Total-N	NO_3	TKN	Total-P	Ortho-P	TDS	TSS
	(cubic feet)	*(lbs)*						
Afternoon	*63,612*	*9.1*	*5.2*	*3.8*	*0.9*	*0.3*	*2,184*	*242*
Evening	*65,259*	*9.4*	*5.3*	*4.1*	*1.0*	*0.3*	*2,118*	*306*
Early Morning	*63,558*	*10*	*6.0*	*4.4*	*1.0*	*0.3*	*2,301*	*274*
Late Morning	*63,873*	*10*	*4.8*	*4.8*	*0.8*	*0.3*	*2,273*	*231*
Totals	***256,302***	***38***	***21***	***17***	***3.7***	***1.4***	***8,877***	***1,053***
	(cf/sq. mi)	*(lbs./sq. mi)*						
Yields	***2,563***	***0.4***	***0.2***	***0.2***	***0.04***	***0.01***	***89***	***11***

Notes:
ISCO samplers are run to collect samples every hour for 24 hours during baseflow sampling.
Each 6 hour set is composited into one composite sample totally 4 composite samples per 24 hour period.
Baseflow samples were collected at the Yori Drain and Boynton Slough monitoring locations but insufficient flow data did not allow for daily load calculations

Winter baseflow loads and yields for four tributaries, Boynton Slough, Yori Drain, lower Steamboat Creek and lower North Truckee Drain are presented in **Table 5-7**.

During the 24-hour baseflow period studied, Boynton Slough flow rates averaged 26 cfs. Under these winter baseflow conditions, Total-N loads from Boynton Slough were measured to be 221 lbs, Total-P loads were measured to be 17 lbs, and TDS loads were measured to be 34,623 lbs.

Yori Drain flow rates averaged 4.2 cfs. Under these winter baseflow conditions, Total-N loads from Yori Drain were measured to be 20 lbs, Total-P loads were measured to be 1.2 lbs, and TDS loads were measured to be 4,150 lbs.

Steamboat Creek baseflow averaged 92 cfs during the 24-hour period we studied. Under these winter baseflow conditions, Total-N loads from Steamboat Creek were measured to be 600 lbs, Total-P loads were measured to be 100 lbs, and TDS loads were measured to be 160,334 lbs.

Finally, North Truckee Drain baseflow averaged 3.8 cfs during the 24-hour period we studied. Under these winter baseflow conditions, Total-N loads from North Truckee Drain were measured to be 72 lbs, Total-P loads were measured to be 3 lbs, and TDS loads were measured to be 19,079 lbs.

Inherent in these comparisons, is that the Steamboat Creek at Clean Water Way station includes the flow received from Yori Drain and Boynton Slough. Loads from these tributaries were measurable. Boynton Slough watershed is roughly 20 percent of the Steamboat Creek watershed at Clean Water Way, and the Yori Drain watershed is 1.7 percent of the SBC watershed at Clean Water Way. To compare using yields (lbs./sq. mile), both Boynton and Yori produced 5 lbs./sq., mile each to only 2 lbs./sq. mile for Clean Water Way. All three stations were comparable in Total-P, 0.3 lbs./sq. mile for both Boynton and Yori and 0.4 lbs./sq. mile for Clean Water Way. Boynton and Clean Water Way were comparable in TDS yields with 111 lbs./sq. mile and 112 lbs./sq. mile, respectively, while Yori only produced 87 lbs./sq. mile. Under winter baseflow, Steamboat Creek discharges the highest constituent loads to the Truckee River and has the highest yields, when compared to North Truckee Drain and other tributaries throughout the region.

Table 5-7 Winter Baseflow Volumes and Constituent Loads for Four Tributaries to the Truckee River, March 18-19, 2019

Boynton Slough at Steamboat Creek								
		Baseflow Loads						
Hydrograph	Storm Runoff Volume	Total-N	NO_3	TKN	Total-P	Ortho-P	TDS	TSS
	(cubic feet)	*(lbs)*						
Afternoon	564,224	*63*	*35*	*26*	*4.9*	*2.4*	*8,101*	*2,325*
Evening	546,683	*51*	*34*	*19*	*3.4*	*1.9*	*8,532*	*956*
Early Morning	576,808	*50*	*33*	*18*	*4.3*	*2.8*	*8,642*	*1,152*
Late Morning	598,948	*56*	*36*	*19*	*4.1*	*2.5*	*9,348*	*972*
Totals	***2,286,664***	***221***	***138***	***82***	***17***	***9.5***	***34,623***	***5,405***
	(cf/sq. mi)	*(lbs./sq. mi)*						
Yields	***47,148***	***5***	***3***	***2***	***0.3***	***0.2***	***714***	***111***

Yori Drain at Steamboat Creek								
		Baseflow Loads						
Hydrograph	Storm Runoff Volume	Total-N	NO_3	TKN	Total-P	Ortho-P	TDS	TSS
	(cubic feet)	*(lbs)*						
Afternoon	32,921	*7.0*	*3.1*	*3.9*	*0.3*	*0.5*	*1,459*	*109*
Evening	30,448	*4.6*	*1.7*	*3.0*	*0.3*	*0.4*	*931*	*91*
Early Morning	28,972	*4.3*	*1.7*	*2.7*	*0.3*	*0.4*	*868*	*83*
Late Morning	31,053	*4.5*	*1.9*	*2.7*	*0.3*	*0.3*	*892*	*81*
Totals	***123,394***	***20***	***8***	***12***	***1.2***	***1.6***	***4,150***	***365***
	(cf/sq. mi)	*(lbs./sq. mi)*						
Yields	***29,379***	***5***	***2***	***3***	***0.3***	***0.4***	***988***	***87***

Steamboat Creek at Clean Water Way								
		Baseflow Loads						
Hydrograph	Storm Runoff Volume	Total-N	NO_3	TKN	Total-P	Ortho-P	TDS	TSS
	(cubic feet)	*(lbs)*						
Afternoon	1,971,180	*160*	*59*	*106*	*28*	*12*	*40,608*	*7,999*
Evening	1,943,190	*146*	*58*	*82*	*23*	*13*	*37,606*	*5,580*
Early Morning	2,006,190	*150*	*61*	*84*	*26*	*15*	*37,572*	*7,514*
Late Morning	2,098,800	*144*	*60*	*81*	*22*	*16*	*44,548*	*6,158*
Totals	***8,019,360***	***600***	***239***	***353***	***100***	***56***	***160,334***	***27,251***
	(cf/sq. mi)	*(lbs./sq. mi)*						
Yields	***32,866***	***2***	***1***	***1***	***0.4***	***0.2***	***657***	***112***

Table 5-7 (cont.)

North Truckee Drain at Big Fish Drive

		Baseflow Loads						
Hydrograph	Storm Runoff Volume	Total-N	NO_3	TKN	Total-P	Ortho-P	TDS	TSS
	(cubic feet)				*(lbs)*			
Afternoon	*86,994*	*21*	*10*	*11*	*0.5*	*0.4*	*4,942*	*652*
Evening	*82,854*	*18*	*10*	*8*	*1.2*	*0.3*	*4,914*	*274*
Early Morning	*79,992*	*16*	*10*	*6*	*0.9*	*0.4*	*4,644*	*190*
Late Morning	*81,504*	*17*	*11*	*6*	*0.8*	*0.3*	*4,579*	*132*
Totals	***331,344***	***72***	***41***	***31***	***3***	***1***	***19,079***	***1,248***
	(cf/sq. mi)				*(lbs./sq. mi)*			
Yields	***3,313***	***0.7***	***0.4***	***0.3***	***0.03***	***0.01***	***190.79***	***12***

Notes:
ISCO samplers are run to collect samples every hour for 24 hours during baseflow sampling.
Each 6 hour set is composited into one composite sample totally 4 composite samples per 24 hour period.

Comparisons between summer and winter baseflow loads can be completed for Steamboat Creek at Clean Water Way and North Truckee Drain at Big Fish Drive in FY2019. Winter loads were higher than summer loads but may be related to the greater flow volumes measured during winter of 2019.

5.6.2 STORM EVENT LOADS COMPARED TO TOTAL MAXIMUM DAILY LOADS ESTABLISHED FOR THE TRUCKEE RIVER AT LOCKWOOD

In this section, we compare measured loads to allocated loads under established TMDLs for 3 constituents: Total-N, Total-P, and TDS in the Truckee River (at Lockwood). Comparisons are presented by storm in the order that the storms occurred. If storm event runoff was measured to be less than 24 hours, we assumed the total storm load to approximate a daily load. If storm event runoff exceeded 24 hours, we show the highest 24-hour load based on the highest 24-hour storm event runoff volume. Using these criteria, we characterize these results as 'daily' loads.

Again, please note that decreases in water quality are expected in high runoff events. Concentration values that exceed WQS do not necessarily reflect overall waterbody annual water quality. High concentration values coupled with high flow volume sometimes result in high daily (24-hour) load values (typical of large frontal storms). When compared to TMDL's these values can seem extreme but need to be framed in the context of single events and not representative of annual loads in the Truckee River.

Table 5-8 shows daily (24-hour) loads measured in storm event runoff on November 21-22, 2018, in comparison to TMDLs established for the Truckee River at Lockwood.

Table 5-8 Daily Loads Measured in Storm Event Runoff, November 21-22, 2018

Daily Loads: November 21-22, 2018 Stormwater Loads

	Constituents		
Monitoring Station	Total-N	Total-P	TDS
Urban Outfalls		*(lbs/day)*	
Oxbow Nature Park	11	1.9	530
Arlington	6.9	2.2	331
Fisherman's II	*51*	*9.0*	*1,550*
Tributaries		*(lbs/day)*	
Yori Drain at Steamboat Creek	21	0.9	3,229
Totals	***90***	***14***	***5,640***
Load Allocations, TMDL Truckee River at Lockwood	**500**	**80**	**780,360**
Daily Load, Percent of Load Allocation under TMDL	***18%***	***18%***	***1%***

Notes:

Load Allocation for the TMDLs represent the total expected or allowable load from non-point and background sources

TMDLs for Total-N, Total-P, and TDS established in 1994 (NDEP, 1994)

Daily loads from three urban outfalls and one tributary (Yori Drain) totaled roughly 90 lbs., 14 lbs. of Total-P, and 5,640 lbs. of TDS. The daily loads for Total-N and Total-P represent 18 percent of the load allocations under the Truckee River TMDL for these constituents. Daily loads for TDS represent less than 1 percent of the load allocations under the Truckee River TMDL. Note that these measurements are from three outfalls and one tributary that total roughly 10 square miles of watershed area. Low percentages are not surprising for this storm of short duration and intensity.

Table 5-9 shows daily (24-hour) loads measured from storm event runoff measured from three urban outfalls and two main tributaries (North Truckee Drain and Steamboat Creek) during the January 16-17, 2019 storm event and compared to TMDLs established for the Truckee River at Lockwood. Because the event duration exceeded 24 hours, maximum daily loads were evaluated using the highest period of maximum runoff volume and associated constituent concentrations.

Table 5-9 Daily Loads Measured from Storm Event Runoff, January 16-17, 2019

Daily Loads: January 16-17, 2019 Stormwater Loads

	Constituents		
Monitoring Station	Total-N	Total-P	TDS
Urban Outfalls		*(lbs/day)*	
Oxbow Nature Park	*24*	*3.1*	*2,295*
Arlington	*36*	*8.7*	*7,085*
Fisherman's II	*73*	*14*	*3,917*
Tributaries			
North Truckee Drain at Big Fish Drive	*1312*	*146*	*123,851*
Steamboat Creek at Clean Water Way	*8638*	*849*	*718,982*
Totals	***10084***	***1021***	***856,129***
Load Allocations, TMDL Truckee River at Lockwood	**500**	**80**	**780,360**
Daily Load, Percent of Load Allocation under TMDL	***2017%***	***1276%***	***110%***

Notes:

Load Allocation for the TMDLs represent the total expected or allowable load from non-point and background sources

TMDLs for Total-N, Total-P, and TDS established in 1994 (NDEP, 1994)

Storm exceeded 24 hours in duration; maximum daily load is calculated using the highest 24-hour runoff volume and associated constituent concentrations.

Total-N daily loads from all points of discharge totaled roughly 10,084 lbs.; Total-P daily loads from all points of discharge totaled roughly 1,021 lbs.; and TDS daily loads totaled 856,129 lbs., over a 24-hour period. This storm event was part of a large frontal storm system. Total-N loads were 2,017 percent of the daily load allocations and Total-P was 1,276 percent of the daily load allocations at Lockwood. These extreme numbers are not out of the ordinary, as compared to past years' data collected during larger storm events that produce high volumes of runoff. TDS loads were approximately 110 percent of the daily load allocations for Lockwood. Loads calculated from this storm event account for 350 square miles of watershed area and include the two largest tributaries to the Truckee River (North Truckee Drain and Steamboat Creek).

Table 5-10 shows daily (24-hour) loads measured in storm event runoff from two major tributaries (North Truckee Drain and Steamboat Creek) to the Truckee River and one major sub-tributary (Boynton Slough feeds Steamboat Creek) during the February 2, 2019 storm event and compared to TMDLs established for the Truckee River at Lockwood.

Table 5-10 Daily Loads Measured from Storm Event Runoff, February 2, 2019

Daily Loads: February 2, 2019 Stormwater Loads

	Constituents		
Monitoring Station	Total-N	Total-P	TDS
Tributaries		*(lbs/day)*	
Steamboat Creek at Clean Water Way	*1095*	*87*	*226,580*
North Truckee Drain at Big Fish Drive	*177*	*18*	*23,971*
Boynton Slough at Steamboat Creek	*507*	*39*	*56,676*
Totals	***1272***	***105***	***250,551***
Load Allocations, TMDL Truckee River at Lockwood	**500**	**80**	**780,360**
Daily Load, Percent of Load Allocation under TMDL	***254%***	***131%***	***32%***

Notes:

Load Allocation for the TMDLs represent the total expected or allowable load from non-point and background sources

TMDLs for Total-N, Total-P, and TDS established in 1994 (NDEP, 1994)

Totals are calculated using only Steamboat Creek at Clean Water Way and North Truckee Drain at Big Fish Drive,

Yori Drain and Boynton Slough discharge into Steamboat Creek upstream of the Clean Water Way monitoring station.

This storm event totaled an average of 0.52 inches of rain from six stations around the Truckee Meadows. Loads are calculated using Steamboat Creek at Clean Water Way and North Truckee Drain only as Boynton Slough discharges into Steamboat Creek upstream of the Clean Water Way monitoring location. Total-N daily loads from the 2 points of discharge totaled roughly 1,272 lbs. or 245 percent of the load allocated under the TMDL for Total-N. Of this daily Total-N load from Steamboat Creek, approximately 46 percent originated from Boynton Slough, which makes up roughly just 20% of the Steamboat Creek watershed. Total-P daily loads from the 2 points of discharge totaled roughly 105 lbs. or 131 percent of the load allocated under the TMDL. Of this daily Total-P load from Steamboat Creek, approximately 45 percent originated from Boynton Slough. TDS daily loads from the 2 points totaled 250,551 lbs., or roughly 32 percent of the load allocated under the TMDL. Of this daily TDS load from Steamboat Creek, approximately 25 percent originated from Boynton Slough.

5.6.3 BASEFLOW LOADS COMPARED TO TOTAL MAXIMUM DAILY LOADS ESTABLISHED FOR THE TRUCKEE RIVER AT LOCKWOOD

In addition to daily storm event loads, we also evaluated daily (24-hour) baseflow loads from available data on two major tributaries that discharge to the Truckee River: Steamboat Creek and North Truckee Drain, relative to the TMDLs. Baseflow sampling followed a 10-day period absent of precipitation but during a period of above average streamflow. Daily, summer baseflow load measured from Steamboat Creek for a 24-hour period sampled September 4-5 for North Truckee Drain and September 6-7, 2018 for Steamboat Creek. Results are shown as compared with TMDLs in **Table 5-11**.

Table 5-11 Daily Loads Measured from Baseflow in Steamboat Creek and North Truckee Drain, September 4-7, 2018

Daily Loads: September 4-7, 2018 Baseflow Loads			
	Constituents		
Monitoring Station	Total-N	Total-P	TDS
Tributaries		*(lbs/day)*	
Steamboat Creek at Clean Water Way	*186*	*30*	*67,512*
North Truckee Drain at Big Fish Drive	*38*	*3.7*	*8,877*
Totals	***224***	***34***	***76,388***
Load Allocations, TMDL Truckee River at Lockwood	**500**	**80**	**780,360**
Daily Load, Percent of Load Allocation under TMDL	***45%***	***42%***	***10%***

Notes:

Load Allocation for the TMDLs represent the total expected or allowable load from non-point and background sources

TMDLs for Total-N, Total-P, and TDS established in 1994 (NDEP, 1994)

Total-N summer baseflow daily load from Steamboat Creek and North Truckee Drain totaled roughly 224 lbs. or roughly 45 percent of the load allocated under the TMDL for Total-N. Total-P daily baseflow load totaled roughly 34 lbs. or roughly 42 percent of the load allocated under the TMDL for Total-P. TDS daily baseflow load totaled about 76,388 lbs. or roughly 10 percent of the load allocated under the TMDL for TDS. The 2019 winter was far above average with most of the precipitation and snowpack coming in late winter and spring. These values reflect high runoff year with higher late season streamflow and very late peak discharge.

Daily (24-hour) winter baseflow load was measured from North Truckee Drain and Steamboat Creek as well as two main tributaries that discharge into Steamboat Creek, Boynton Slough and Yori Drain. The measurements are compared with TMDLs is presented in **Table 5-12** for a 24-hour period sampled March 18-19, 2019.

Table 5-12 Daily Load Measured from Baseflow in North Truckee Drain, Steamboat Creek, Boynton Slough and Yori Drain, March 18-19, 2019

Daily Loads: March 18-19, 2019 Baseflow Loads			
	Constituents		
Monitoring Station	Total-N	Total-P	TDS
Tributaries		*(lbs/day)*	
Steamboat Creek at Clean Water Way	*600*	*100*	*160,334*
North Truckee Drain at Big Fish Drive	*72*	*3.4*	*19,079*
Yori Drain at Steamboat Creek	*20*	*1.2*	*4,150*
Boynton Slough at Steamboat Creek	*221*	*17*	*34,623*
Totals	***672***	***103***	***179,413***
Load Allocations, TMDL Truckee River at Lockwood	**500**	**80**	**780,360**
Daily Load, Percent of Load Allocation under TMDL	***134%***	***129%***	***23%***

Notes:

Load Allocation for the TMDLs represent the total expected or allowable load from non-point and background sources

TMDLs for Total-N, Total-P, and TDS established in 1994 (NDEP, 1994)

Totals are calculated using only Steamboat Creek at Clean Water Way and North Truckee Drain at Big Fish Drive,

Yori Drain and Boynton Slough discharge into Steamboat Creek upstream of the Clean Water Way monitoring station.

Totals are calculated using Steamboat Creek at Clean Water Way and North Truckee Drain only as Boynton Slough and Yori Drain discharge into Steamboat Creek upstream of the Clean Water Way monitoring location and are included in Clean Water Way values. Total-N daily baseflow load from these two major tributaries totaled roughly 672 lbs. or roughly 134 percent of the load allocated under the TMDL for Total-N. Of this daily Total-N load from Steamboat Creek, approximately 40 percent originated from Boynton Slough and Yori Drain. Total-P daily baseflow loads totaled roughly 103 lbs. or roughly 129 percent of the load allocated under the TMDL for Total-P. Of this daily Total-P load from Steamboat Creek, approximately 18 percent originated from Boynton Slough and Yori Drain. TDS daily baseflow loads totaled about 179,413 lbs. or roughly 23 percent of the load allocated under the TMDL for TDS. Of this daily TDS load from Steamboat Creek, approximately 24 percent originated from Boynton Slough and Yori Drain. Other non-point and background sources of loads can originate from other smaller tributaries in the Truckee Meadows and illicit discharges to the storm drain network.

Per the 2018 SAP, the watersheds with highest loads have varying sizes, pressures by land uses, and challenges presented by imperviousness.

Yori Drain has a watershed area of just 3.8 square miles and has land uses including mixed residential-commercial, agriculture, golf courses, historical mining, geothermal operations, new construction, an airport and major roadways. This is also the most impervious watershed in the region, at 48 percent imperviousness.

Boynton Slough has a watershed area of 52 square miles and has land uses including open space in the upper watershed, and mixed residential-commercial, agriculture, golf courses, historical mining, geothermal operations, new construction, an airport, and major roadways. As well, Boynton Slough drains the major outlet of Virginia Lake, an urban storm water detention basin in Southwest Reno. This sub-watershed has 35 percent imperviousness.

6 CONCLUSIONS

This report presents results from the FY2019 monitoring year and summarizes both storm event and baseflow (ambient) conditions for selected stations in the Truckee Meadows Permit Area. Data are representative of the storms and baseflow conditions sampled and may not be characteristic of other periods that were not sampled. Furthermore, this report does not provide an analysis of trends over time, but instead captures conditions and water quality measured in FY2019 per the requirements of the MS4 permit. Please note that decreases in water quality are expected in high runoff events and the purpose of this project is to get an annual snapshot of at least two storms that met the qualifications for sampling as set out in the 2018 SAP.

Total annual precipitation in the Truckee Meadows in FY2019, as measured at the Reno-Tahoe International Airport, was 12.04 inches, roughly 62 percent greater than the long-term average of 7.40 inches. Multiple storms were sampled in FY2019 to meet the stormwater sampling goal of 2 samples per station. Storms were characteristic of the Truckee Meadows and included mostly frontal storm systems. Baseflow conditions were sampled in both summer and winter to characterize background water quality condition in major tributaries to the Truckee River in the Truckee Meadows.

NDEP has established water quality standards (WQS) in listed waters, based on concentration. We summarize only 3 constituents here (Total-N, Total-P, and TDS) for which there are TMDLs established for on the Truckee River. Total-N concentrations in storm events mostly exceeded WQS in all storms sampled where WQS are established. Total-N concentrations in tributary baseflow mostly exceeded WQS across all locations sampled and where WQS are established. Highest storm event concentrations were measured from urban outfalls. Whereas, the highest baseflow concentrations were measured from North Truckee Drain and Yori Drain. Overall, most summer baseflow samples were below WQS. Instances where winter baseflow samples exceeded WQS could be due to higher flow volume from snowmelt runoff.

Excess Total-P can be a limiting nutrient in surface waters. Single value WQS do not exist for Total-P in most of the waters monitored; however, annual averages are typically provided and suggest concentrations should not exceed between 0.05 mg/L and 0.10 mg/L over the long-term. Across all storms sampled at all stations, Total-P concentrations ranged between 0.09 mg/L and 4.7 mg/L. Highest storm event Total-P concentrations were measured from most stormwater urban outfalls. Total-P concentrations in tributary baseflow ranged between 0.03 mg/L to as high as 0.4 mg/L. Some storm sample concentrations are high as would be expected in runoff events, but annual averages of Total-P would not be severely affected by the one-time storm related increases.

TDS concentrations measured from storm events exceeded WQS in less than half of the samples collected. Baseflow TDS concentrations exceeded WQS in Samples from both North Truckee Drain sites and Chalk Creek, all others were below WQS. In some cases, TDS baseflow concentrations exceeded storm event concentrations which may suggest irrigation returns, illicit discharges, or other sources that occur during non-precipitation runoff.

Physical parameters measured from both storm events and baseflow also suggest conditions that exceed WQS including turbidity and pH. Dissolved oxygen measurements were all within an acceptable range or met WQS, although there were a few very high readings at North Truckee Drain during winter baseflow. Also, Yori Drain has consistently exhibited very high dissolved oxygen measurements since the inception of the monitoring station that could be related to organic activity in neighboring wetlands. Once again, high single sampled values do not necessarily reflect an increase in annual averages for WQS.

Storm event and baseflow loads were quantified at stations with streamflow gage instrumentation and automated samplers—which allowed for multiple samples to be collected over a storm event hydrograph or time. Loads measured in FY2019 suggest that both stormwater urban outfalls and tributaries can contribute significant nutrient loading to receiving waters. In fact, Steamboat Creek loads exceeded TMDLs established for the Truckee River for Total-N and Total-P in both storm events and winter baseflow collected at the station (January 2019, February 2019 and March 2019). The North Truckee Drain loads also exceeded the TMDL levels during the January 2019 storm event.

Loads measured in FY2019 suggest that spatial scales are important. For example, tributaries draining large areas typically measure the highest loads; however, if stations are compared by yields, areas with more urban land-uses typically are responsible for higher pollutant yields. Industrial land use is typically found to discharge higher levels of TDS than residential or commercial land use. Agricultural land use typically is found to have elevated levels of nutrients, both from livestock, and from septic tanks and potential seepage. A spatial analysis of current land use practices and percentages for each drainageway may shed light on more clear sources of pollutants at a watershed level.

7 RECOMMENDATIONS

In previous monitoring years, we recommended that this program continue to adapt to new findings and modify the program such that a nesting approach to sampling can be used to target source areas of stormwater pollution. This approach began in the Steamboat Creek Watershed. In FY2018, additional automated sampling stations were installed on Yori Drain and Boynton Slough, tributaries to Steamboat Creek based on a 2014 special study that identified higher pollutant loading originating from Steamboat Creek between Clean Water Way and the Narrows. Preliminary results suggest that Boynton Slough may be a source of excess nutrients and other pollutants. We will continue to monitor this tributary in FY2020 and suggest that the Committee begin to consider additional nested monitoring stations in the Boynton Slough watershed for future monitoring years (e.g., Boynton Slough above Evans Creek or Dry Creek). Separately, this could also be achieved under a Special Study.

Quantification and comparison of loads and yields can assist co-permittees in the Truckee Meadows in relating these findings to areas of concern, so that appropriate management practices to improve stormwater and baseflow quality can be developed or ordinances for new development evaluated. Currently, we have observed higher nutrient loadings measured during the first flush, or during the first large, frontal storm that typically occurs in the fall of each year. Due to these findings, annual stormwater BMP implementation in the late summer and early fall to maximize effectiveness of operations in reducing these loads has been implemented to the extent possible by maintenance staff and should continue to be evaluated.

Effective planning for agency staff with timely implementation can yield significant results for improvements to stormwater protection programs. Use of Best Management Practices including post-construction structural controls maintenance, construction site BMP enforcement, erosion prevention, sediment control, street sweeping, vacuuming of storm drains, general litter pick-up, and swale/rain gutter maintenance has been implemented and can help minimize stormwater pollution. Each agency may develop a schedule within their own Corporation Yard Storm Water Pollution Prevention Plan for most effective BMP maintenance timing. This document may be expanded outside of the Corporation Yard, to include other departments and municipal properties, equipment, staff and operations.

Numerous agricultural ditch tailouts, visible on Fig. 3.1, can influence water quality in many of the tributaries monitored under this program. Folding in an understanding of agricultural water ditch operations, complete with practices and timing of activities for maintenance, would help inform water quality and water quantity seen in receiving waters. Acquiring the ditch operations schedules prior to FY sampling may allow better explanation of results in subsequent year's reports.

We anticipate that a new Truckee Meadows MS4 permit and a revised Nevada 303(d) list of impaired water bodies will be issued sometime in FY2020. At that time, we recommend that a meeting is convened between Balance Hydrologics and the SWPCC to discuss changes associated with the new permit and listings of new tributaries or delisting of currently listed tributaries or water bodies and how they influence or modify this program.

Balance completed a special study that evaluated water quality trends over the years for the water bodies monitored as part of this program. Results provide insight into which water bodies are improving and which ones continue to degrade. Results may also inform changes to the program including relocating monitoring stations, new constituents to be measured or monitoring to be discontinued.

Fecal bacteria (i.e., *E. coli*, total coliform) is identified as a constituent limiting water quality in some of the sites monitored. However, holding times (8 hours) required to perform the necessary analytical methods limit when samples can be collected. In many cases, samples are collected at times that do not facilitate immediate delivery to the lab and analysis (i.e., weekends, evenings). As a result, bacteria are not often quantified. If additional data is desired on this constituent, we suggest a special study is designed and implemented to facilitate a robust data set of bacteria counts in storm events. The design would target storms or times that allow for the analytical holding times to be met (i.e. storms that fall within the 10-day dry period required in the 2018 SAP for storm water sampling) and would be reported separately from the programmatic stormwater sampling included in this report.

8 LIMITATIONS

This report was prepared in general accordance with the accepted standard of practice in surface-water hydrology in Nevada for projects of similar scale at the time the investigations were performed. No other warranties, expressed or implied, are made. As is customary, we note that readers should recognize that the interpretation and evaluation of factors affecting the hydrologic context of any site is a difficult and inexact art. Judgments leading to conclusions and recommendations are generally made with an incomplete knowledge of the conditions present. More extensive or extended studies can reduce the inherent uncertainties associated with such studies.

Findings, interpretations and recommendations contained in this report are intended for the exclusive use of The Truckee Meadows Stormwater Permit Coordinating Committee, NDOT, and Western Regional Water Commission, under the conditions presently prevailing except where noted otherwise. This report and its contents have been developed solely to evaluate water quality at discrete locations in the Truckee Meadows for the sole purposes and in the context described above. Data, interpretations and analyses developed for this report may not be directly applicable to other uses. Balance Hydrologics, Inc. should be consulted prior to applying the contents of this report to stormwater BMP design, drainage or flooding management or for any other purposes not specifically cited in this report.

Finally, we ask that readers who have additional pertinent information, who observed changed conditions, or who may note material errors should contact us with their findings at the earliest possible date, so that timely changes may be made.

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APPENDICES

APPENDIX A

Station Observer Logs

Station Observer Log:
Arlington Street (H-19)

Site Conditions				Pipe or Streamflow			Water Quality Observations								Remarks
Date/Time (observer time)	Observer	Stage	Hydrograph	Flow	Streamflow Source	Estimated Accuracy	Water Temperature	Field Specific Conductance	Adjusted Specific Conductance	Dissolved Oxygen	Dissolved Oxygen	pH	Turbidity	Samples collected?	
		(feet)	(R/F/S/B)	(cfs)	(M, R, E)	(e/g/f/p)	(oC)	(µmhos/cm)	(at 25 oC)	(%)	(mg/L)		(NTU)	(yes/no)	
2018-07-12 16:45	bt	--	dry	--	--	--	--	--	--	--	--	--	--	no	Power has been restored to the site; outfall is dry with little debris; reconnected datalogger and connected at 17:00 with logger link
2018-10-04 10:25	jj	--	--	--	--	--	--	--	--	--	--	--	--	no	No samples collected; removed bottles; disabled program through logger link
2018-11-21 11:48	bt,jj	--	dry	--	--	--	--	--	--	--	--	--	--	no	Loaded ISCO with bottles and iced for sampling; culvert is dry; set using logger link; rainfall volume was not working properly so we manually set flow pacing based on forecast of 0.25 inches of rain; 751 cf per sample
2018-11-21 20:30	jj, bkh	0.12	F	--	--	--	--	--	--	--	--	--	--	yes	Falling limb of first flush; stage was too low to initiate sampling; collected three manual samples as flow dissipated; reset ISCO at 20:55 to sample every 230cf above 0.14 ft of stage
2018-11-22 10:35	pk, bkh	--	--	--	--	--	--	--	--	--	--	--	138.9, 103.2, 94.32, 105.4	yes	First flush was processed on 11/22/18; H-19 (1): T 3.8°C, C 257, SC 435, pH 6.93, H-19 (2): T 3.4°C, C 82, SC 140, pH 7.31, H-19(3): T 3.2°C, C 85, SC 146, pH 7.47, h-19(4): T 3.9°C, C 128, SC 216, pH 7.37
2019-01-05 13:00	bt	--	dry	--	--	--	--	--	--	--	--	--	--	no	Set up ISCO for sampling; forecast of 0.13 inches of precipitation; 96 cubic feet per sample using logger link set up--verified using calculator and rain to runoff curve equation
2019-01-05 15:57	bt	--	dry	--	--	--	--	--	--	--	--	--	--	no	Turned off ISCO and capped bottles after NWS lowered chances of rain
2019-01-16 10:16	bt	0.13	B	0.21	R	p	2.70	503	877	96	11.0	8.24	212.9	yes	Grab sample collected using ISCO at 10:35 for first flush; brown water from snowmelt run-off from the first wave of the storm; sample used for first flush; water quality readings from sample; set ISCO using logger link to sample starting at 0.3ft for a forecast of 0.7 inches of rain flow paced at 3204 cf/sample; verified pacing volume with rain to run-off curve equation; 1-2 inches of snow on sidewalk; piles of snow on street corners creating runoff in street
2019-01-17 15:08	bt	0.11	B	--	--	--	--	--	--	--	--	--	124.3, 87.45	yes	24 samples collected; processed samples into composite bottles: H-19 (2) T 2.2°C, C 35, SC 64, pH 8.31; H-19 (3) T 2.2°C, C 20, SC 36, pH 8.14; no falling limb samples as forecast underestimated precipitation amounts and flow pacing finished before falling limb

Observer Key: (bkh) is Brian Hastings, (pk) is Peter Kulchawik, (bt) is Ben Trustman, (jj) is Jack Jacquet

Stage: Water level observed on staff plate,

Hydrograph: Describes stream stage as rising (R), falling (F), steady (S), or baseflow (

Streamflow Source: measured by a hydrologist (M), obtained from an existing rating curve or gaging station [R], or estimated E

Specific conductance: Measured in micromhos/cm in field; then adjusted to 25degC by equation (1.8813774452 - [0.050433063928 * field temp] + [0.00058561144042 * field temp^2]) * Field specific conducta

Turbidity values are reported from the sample using a desktop turbidimeter and do not reflect laboratory analysis and re

Station Observer Log:
Mary Wahl Ditch (SDOE 008936)

Site Conditions				Pipe or Streamflow			Water Quality Observations								Remarks
Date/Time (observer time)	Observer	Stage	Hydrograph	Flow	Streamflow Source	Estimated Accuracy	Water Temperature	Field Specific Conductance	Adjusted Specific Conductance	Dissolved Oxygen	Dissolved Oxygen	pH	Turbidity	Samples collected?	
		(feet)	(R/F/S/B)	(cfs)	(M, R, E)	(e/g/f/p)	(oC)	(µmhos/cm)	(at 25 oC)	(%)	(mg/L)		(NTU)	(yes/no)	
2018-08-02 15:15	bt,jj	0.22	B	--	--	--	20.9	512	553	70	5.57	7.79	--	no	Site visit to run diagnostics on ISCO; Battery level at 12.89; All diagnostics read ok; lots of debris on probe and intake hose location; ISCO reading negative velocity with visual confirmation of positive flow; contact City of Sparks to clean outfall; changed desiccant
2018-10-03 13:15	bkh,jj	0.03	B	--	--	--	19.5	327	365	65	5.27	8.05	--	no	Ran diagnostics-tested pump; loaded ISCO with 24 bottles and iced; programmed for 0.23 inches of rain; set to start at 0.16 inches; opened manhole cover-instrument and intake free of debris; water clear with little flow
2018-10-04 11:25	jj	--	--	--	--	--	--	--	--	--	--	--	--	no	No samples collected; removed bottles and disabled ISCO; left battery in box; ISCO was triggered to sample but stage was not high enough to pull up sample volume
2018-11-21 15:10	bt, jj	--	--	--	--	--	--	--	--	--	--	--	--	no	Removed manhole and found no visible flow; loaded ISCO with 24 bottles and iced; set to sample greater than 0.16 ft, 5104 cf per sample flow paced with forecast of 0.2 inches of rain
2018-11-22 11:30	pk, bkh	0.30	F	--	--	--	9.4	130	185	105	10.28	7.24	--	yes	Only two bottles sampled-one at 21:24 on 11/21/18 and one at 11:01 on 11/22/18; ISCO not registering flow but stage indicates there was a storm hydrograph; SDOE008936(1): T 6.2°C, C 261, SC 407, pH 6.78, SDOE008936(4): T 7.4°C, C 101, SC 152, pH 7.27; left clean bottle in ISCO and capped
2019-01-05 14:00	bt	--	--	--	--	--	--	--	--	--	--	--	--	no	Signal strength is 0% and spectrum strength says error; visual inspection revealed intake and flow module is covered in sediment; no flow in culvert but some pooling; need to remove the probe arm and lift out to service
2019-01-10 9:07	bt,jj	0.17	--	--	--	--	--	--	--	--	--	--	--	no	Probe reading 8.77 ft/s; signal strength 0% and spectrum strength read error; visual inspection of culvert and probe; low flow and lots of sediment in culvert; probe was covered with sediment; removed the probe assembly and cleaned off sediment; replaced probe in water and no change in signal strength; Removed probe assembly; removed probe and module to send in to Teledyne for repair; left bolts in flange at culvert
2019-01-16 12:15	bt	--	R	--	--	--	4.5	159	262	102	11.28	8.27	137.1	yes	Re-installed probe arm with extra flow mod cable and sample tubing; water level is high and flowing; grab sample collected at 12:55-water quality is from grab sample; some snow piled near JoBox but streets are melted
2019-01-16 17:15	bt	--	--	--	--	--	--	--	--	--	--	--	--	no	Installed flow module from SBC@CWW ISCO and set sampler to start immediately; flow pacing at 10,939cf per sample

Observer Key: (bkh) is Brian Hastings, (pk) is Peter Kulchawik, (bt) is Ben Trustman, (jj) is Jack Jacquet

Stage: Water level observed on staff plate,

Hydrograph: Describes stream stage as rising (R), falling (F), steady (S), baseflow (B), or backwater (BW)

Streamflow Source: measured by a hydrologist (M), obtained from an existing rating curve or gaging station [R], or estimated E

Specific conductance: Measured in micromhos/cm in field; then adjusted to 25degC by equation (1.8813774452 - [0.050433063928 * field temp] + [0.00058561144042 * field temp^2]) * Field specific conductance

Turbidity values are reported from the sample using a desktop turbidimeter and do not reflect laboratory analysis and results

Station Observer Log:
Fishermans Park II (D-16)

Site Conditions				*Pipe or Streamflow*			*Water Quality Observations*								*Remarks*
Date/Time (observer time)	Observer	Stage	Hydrograph	Flow	Streamflow Source	Estimated Accuracy	Water Temperature	Field Specific Conductance	Adjusted Specific Conductance	Dissolved Oxygen	Dissolved Oxygen	pH	Turbidity	Samples collected?	
		(feet)	*(R/F/S/B)*	*(cfs)*	*(M, R, E)*	*(e/g/f/p)*	*(oC)*	*(µmhos/cm)*	*(at 25 oC)*	*(%)*	*(mg/L)*		*(NTU)*	*(yes/no)*	
2018-08-02 15:51	bt,jj	0.11	B	--	--	--	--	--	--	--	--	--	--	no	Nuisance flow with low stage that is too low to register flow on ISCO-est. 0.01 cfs; new battery; ran diagnostics and all tests ok; changed desiccant
2018-10-03 13:45	bkh,jj	0.02	B	--	--	--	--	--	--	--	--	--	--	no	Trickle of flow; intake and instrument in good condition; ran diagnostics-good; many homeless encampments along river downstream-no camps at station; battery 12.8V; set ISCO for 0.23 inches of rain (5374 cf per sample); not enough water to test water quality
2018-10-04 10:55	jj	--	--	--	--	--	--	--	--	--	--	--	--	no	No samples collected; removed bottles disabled ISCO and left battery in box
2018-11-21 12:30	bt, jj	--	dry	--	--	--	--	--	--	--	--	--	--	no	Loaded ISCO with bottles and iced; set for flow pacing at 4637 cf anticipating 0.2 inches of rain
2018-11-22 11:00	pk, bkh	--	B	0.42	R	g	9.2	154	220	103	10.0	7.85	177.5, 144.0, 133.0, 64.89	yes	21 bottles collected; D-16(1): T 4.9°C, C 505, SC 820, pH 7.06, D-16(2): T 5.1°C, C 128, SC 206, pH 7.64, D-16 (3): T 5.2°C, C 82, SC 132, pH 8.07, D-16(4): T 5.9°C , C 88, SC 139, pH 8.00
2019-01-05 13:30	bt	--	dry	--	--	--	--	--	--	--	--	--	--	no	Only a small trickle of water that is infiltrating into the cracks of the concrete and not reaching the river; set ISCO to sample >0.15 ft, 2918 cubic feet volume per sample based on forecast of 0.13 inches of precipitation; set sampler to do three retries when sampling in low flow
2019-01-05 15:38	bt	--	dry	--	--	--	--	--	--	--	--	--	--	no	Capped bottles and turned ISCO off after NWS lowered rain forecast
2019-01-16 11:15	bt	0.56	R	4.21	R	p	3.4	515	875	100	11.4	8.37	231.5	yes	Lots of flow in outfall; forecast is for 0.65 inches of rain; set ISCO for flow pacing at 15684 cf/sample starting above 0.65 ft; Signal strength is 26%; First Flush sample collected at 11:26; water quality is from collected sample; snow on riverbanks and outfall
2019-01-17 15:46	bt	0.29	F	0.93	R	p	5.6	107	170	101	10.8	7.84	199.0, 253.6, 107.7	yes	24 samples collected; forecast underestimated precipitation amounts; collected falling limb sample on site before compositing other samples (water quality noted left): D-16 (2) T 2.2°C, C 71, SC 126, pH 8.28; D-16 (3) T 2.2°C, C 32, SC 57, pH 8.45

Observer Key: (bkh) is Brian Hastings, (pk) is Peter Kulchawik, (bt) is Ben Trustman, (jj) is Jack Jacquet

Stage: Water level observed on staff plate

Hydrograph: Describes stream stage as rising (R), falling (F), steady (S), or baseflow (B)

Streamflow Source: measured by a hydrologist (M), obtained from an existing rating curve or gaging station [R], or estimate

Specific conductance: Measured in micromhos/cm in field; then adjusted to 25degC by equation (1.8813774452 - [0.050433063928 * field temp] + [0.00058561144042 * field temp^2]) * Field specific conductance

Turbidity values are reported from the sample using a desktop turbidimeter and do not reflect laboratory analysis and results

Station Observer Log:
Oxbow Nature Park (C-24)

Site Conditions				*Pipe or Streamflow*			*Water Quality Observations*								*Remarks*
Date/Time (observer time)	Observer	Stage	Hydrograph	Flow	Streamflow Source	Estimated Accuracy	Water Temperature	Field Specific Conductance	Adjusted Specific Conductance	Dissolved Oxygen	Dissolved Oxygen	pH	Turbidity	Samples collected?	
		(feet)	*(R/F/S/B)*	*(cfs)*	*(M, R, E)*	*(e/g/f/p)*	*(oC)*	*(µmhos/cm)*	*(at 25 oC)*	*(%)*	*(mg/L)*		*(NTU)*	*(yes/no)*	
2018-08-02 16:33	bt,jj	0.21	B	0.28	R	g	--	--	--	--	--	--	--	no	Visual inspection of intake hose and probe; ran diagnostics and all check ok; changed desiccant; new battery
2018-10-03 14:30	bkh,jj	0.19	B	--	--	--	--	--	--	--	--	--	--	no	Bottles loaded and iced; set to sample for 0.25 starting at 0.25 feet; forecast 0.23 inches of rain
2018-10-04 9:45	jj	--	--	--	--	--	--	--	--	--	--	--	--	no	No samples collected; removed bottles and turned off ISCO; homeless camp is gone
2018-11-21 11:05	bt, jj	0.16	B	--	--	--	--	--	--	--	--	--	--	no	Visible flow but ISCO is not registering flow due to low level; not deep enough for WQ measurement; reset ISCO clock; loaded with bottles and iced; set program for 1607 cf flow paced sampling above 0.225 stage with 0.25 inches of forecast precipitation
2018-11-22 9:15	pk, bkh	--	B	--	--	--	--	--	--	--	--	--	20.20, 13.10	yes	Rained 0.1 inches previous night at 21:00 and another 0.15 inches between 04:00-06:00; ISCO did not capture second component of storm due to technical issues; Composite sample do not necessarily match hydrograph due to inconsistent storm input; C-24(1): T 4.2°C, C 469, SC 781, pH 7.06, C-24(2): T 4.0°C, C 119, SC 200, pH 7.21, C-24(3): T 4.0°C, C 122, SC 204, pH 7.73, C-24(4) T 4.0°C, C 113, SC 190, pH 7.69
2019-01-05 12:00	bt	0.13	B	--	--	--	--	--	--	--	--	--	--	no	Set ISCO to sample >0.165 ft and 531 cubic feet per sample; forecast is for 0.13 inches of rain but could be rain snow mix or just snow; set for three retries per sample; visual inspection revealed very low flow in culvert
2019-01-05 16:05	bt	--	B	--	--	--	--	--	--	--	--	--	--	no	Capped bottles and turned ISCO off; NWS lowered forecast of rain and increased possibility of just snow
2019-01-16 9:30	bt	0.25	B	1.92	R	g	4.4	651	1075	--	--	8.37	--	no	Forecast is for 0.85 inches of rain; set ISCO to sample flow pacing at 6238 cf/sample; battery 12.24V; 4-5 inches of snow in park and around monitoring station; WQ meter prob not completely submerged by flow in culvert; no debris in culvert; iced and filled with bottles
2019-01-17 13:59	bt, bkh, tg	0.41	F	2.70	R	g	5.30	117	187	100	10.8	8.33	112.6, 103.1, 133.2, 53.5	yes	24 samples collected; processed composite samples: C-24 (1) T 2.7°C, C 199, SC 347, pH 8.32; C-24 (2) T 2.6°C, C 70, SC 123, pH 8.25; C-24 (3) T 2.6°C, C 28, SC 49, pH 8.17; forecast underestimated precipitation and flow paced samples finished before falling limb samples were able to be collected

Observer Key: (bkh) is Brian Hastings, (pk) is Peter Kulchawik, (bt) is Ben Trustman, (tg)is Teresa Garrison, (jj) is jack Jacquet

Stage: Water level observed on staff plate,

Hydrograph: Describes stream stage as rising (R), falling (F), steady (S), or baseflow (I

Streamflow Source: measured by a hydrologist (M), obtained from an existing rating curve or gaging station [R], or estimated E

Specific conductance: Measured in micromhos/cm in field; then adjusted to 25degC by equation (1.8813774452 - [0.050433063928 * field temp] + [0.00058561144042 * field temp^2]) * Field specific conduct

Turbidity values are reported from the sample using a desktop turbidimeter and do not reflect laboratory analysis and results

Station Observer Log:
Thomas Creek at South Meadows Pkwy (TC@SMP)

Site Conditions					Streamflow					Water Quality Observations								Remarks
Date/Time (observer time)	Observer	Old Stage	New Stage	Hydrograph	Streamflow	Streamflow Source	Estimated Accuracy	High-water Mark	HWM date?	Water Temperature	Field Specific Conductance	Adjusted Specific Conductance	Dissolved Oxygen	Dissolved Oxygen	pH	Turbidity	Samples collected?	
		(feet)	(feet)	(R/F/S/B)	(cfs)	(M, R)	(e/g/f/p)	(feet)	(M/D/YY)	(oC)	(μmhos/cm)	(at 25 oC)	(%)	(mg/L)		(NTU)	(yes/no)	
2018-08-02 10:48	bt,jj		3.90	B	0.55	M	g/f	--	--	17.9	102	118	81	6.7	8.00	--	no	Significant vegetation in and around the gage and stream; old gage covered in vegetation; water level at old gage low and flowing; water milky and turbid
2018-09-05 11:01	bt,nb		3.84	B	0.30	M	g	--	--	15.4	109	135	105	9.2	8.28	5.34	yes	Water clear ; vegetation grown in channel; sprinklers running in adjacent landscaping but no indication of run-off into stream; ambient sample collected at 11:20
2018-09-07 15:27	bt		3.83	B	--	--	--	--	--	--	--	--	--	--	--	--	no	Installed new In-Situ logger at 15:40; set to launch at 16:00; tight fit with second In-situ logger in two inch well
2018-10-01 14:54	bt		4.01	B	--	--	--	--	--	14.8	103	128	108	9.5	7.74	--	no	Removed old In-Situ logger SN 183055 at 14:56; lots of vegetation around and in channel
2018-10-03 16:15	bkh, jj		4.11	F	1.66	M	g	4.35	2018-10-03	13.8	102	129	90	8.2	7.98	8.05	yes	First precip since May(?); very isolated; rain just ended; water moderately turbid, high-water mark suggests peak just past; collected sample at 16:05
2018-11-26 11:30	bt		4.32	S	--	--	--	--	--	2.1	59	104	114	13.5	8.69	--	--	Flowing but at same stage as previous measurements so no flow measurement-plan on returning on 11/29/18 during storm
2018-11-29 11:36	bt,jj		4.56	S	--	--	--	--	--	3.7	50	82	92	10.2	8.17	--	no	Leaf dam 20 ft downstream; cleared and cut back some of the grasses on the banks to prevent further backup; stage dropped 0.02 after leaf dam released; large debris build up in upstream right side of culvert under driveway
2018-12-13 12:36	bt		4.55	S	2.21	M	g/f	--	--	0.4	51	97	97	12.1	7.90	--	no	Water clear; no debris build up downstream; vegetation is dead and dry
2019-01-17 10:30	bkh, tg		5.45	U	17.0	M	f	*6.7*	2019-01-17	0.7	81	152	99	12.4	7.63	52.08	yes	Raining; over 2 inches over watershed, snow level at roughly 5,500 ft; water turbid, elevated stage, peak flow occurred around midnight
2019-01-22 14:15	bt		4.95	S	3.6	M	g	--	--	0.8	69	129	112	13.9	7.71	--	no	Water high; milky and turbid; evidence of water over staff gage from peak flow during last storm
2019-02-13 13:00	bt, bkh		5.60	R	11.0	M	g/f	6.30	43509.00	-0.4	50	96	106	13.5	7.45	--	no	Ice in flow; possible snowmelt from rain on snow; flowing out of both sides of culvert;field flooding downstream at beaver dam
2019-02-19 13:45	bkh		4.93	S	--	--	--	*7.0*	2019-02-14	0.1	63	120	95	12.0	8.12	--	no	Sunny, 32° F; elevated stage; possible ice-affected stage; no flow measurement because of ice in channel and on surface; HWM highest observed this year; may need to calculate peak flow indirectly for rating curve
2019-03-19 11:34	bt		5.10	S	3.0	M	g	--	--	4.9	70	114	99	10.9	8.21	3.97	yes	Sample collected at 11:25; water is clear; stage is high; primarily flowing from left side culvert upstream; standing water in meadow downstream
2019-04-03 14:00	bkh		5.28	F	--	--	--	--	--	-- 7.9	85	126	102	10.6	7.89		no	Recent rain; elevated stage; slightly turbid, flow is likely combination of stormwate
2019-06-21 13:42	jj		5.44	F	10.9	M	g/f	--	--	13.7	75	96	105	9.5	9.42	--	no	Water turbid, unable to see channel bed right next to gage; significant vegetation growing in stream and along banks; gage is in good condition.

Observer Key: (bkh) is Brian Hastings, (bt) is Ben Trustman, (tg) is Teresa Garrison, (jj) is Jack Jacquet, (nb) is Nick Brothers City of Reno
Stage: Water level observed on staff plate,

Hydrograph: Describes stream stage as rising (R), falling (F), steady (S), or baseflow (B)

Streamflow Source: measured by a hydrologist (M), obtained from an existing rating curve or gaging station [R]

Specific conductance: Measured in micromhos/cm in field; then adjusted to 25degC by equation (1.8813774452 - [0.050433063928 * field temp] + [0.00058561144042 * field temp^2]) * Field specific conductance

Turbidity values are reported from the sample using a desktop turbidimeter and do not reflect laboratory analysis and results

Station Observer Log:
Whites Creek at Old Virginia Hwy (WC@OVH)

Site Conditions				Streamflow					Water Quality Observations								Remarks
Date/Time (observer time)	Observer	Stage	Hydrograph	Streamflow	Streamflow Source	Estimated Accuracy	High-water Mark	HWM date?	Water Temperature	Field Specific Conductance	Adjusted Specific Conductance	Dissolved Oxygen	Dissolved Oxygen	pH	Turbidity	Samples collected?	
		(meters)	*(R/F/S/B)*	*(cfs)*	*(M, R)*	*(e/g/f/p)*	*(feet)*	*(M/D/YY)*	*(oC)*	*(µmhos/cm)*	*(at 25 oC)*	*(%)*	*(mg/L)*		*(NTU)*	*(yes/no)*	
2018-09-04 12:35	bt	0.45 (TROA)	R	1.8	R	g	--	--	14.4	75.3	94.4	109.1	9.7	7.72	14.5	yes	Ambient sample collected at 12:38; water clear; low flow
2019-01-17 10:28	bt	1.35 (TROA)	F	9.5	R	g	--	--	1.3	46.0	84.0	109.0	13.1	7.69	58.7	yes	Grab sample collected at 10:35; weir downstream of the street has debris over top indicating overflow at peak; culvert at freeway is jammed with debris but not backwatering; water turbid
2019-02-02 11:45	tg, bkh	1.07	U	6.7	R	g	--	--	3.5	55.0	94.0	95.0	10.7	7.61	23.2	yes	Moderate rain; heavy rain previous 30 minutes; elevated flow, turbid. Flume has excess debris on top from previous events; culvert under I-580 is almost clogged with debris.
2019-03-18 15:10	bt	--	--	--	--	--	--	--	7.7	56.8	85.0	96.0	9.9	7.77	0.4	yes	Water is very clear; no debris at weir but some debris at culvert near 580; sample collected at 15:15
2019-06-21 15:00	jj	--	--	--	--	--	--	--	--	--	--	--	--	--	--	no	Water is turbid, unalble to see channel bed. Debris racked on chain link fence and some small debris on the weir. No major changes to channel between culvert and weir.

Observer Key: (bkh) is Brian Hastings, (bt) is Ben Trustman, (tg) is Teresa Garriso
Stage: Water level observed on staff plate, (staff plate is metric at this locatio
Hydrograph: Describes stream stage as rising (R), falling (F), steady (S), or baseflow (
Streamflow Source: measured by a hydrologist (M), obtained from an existing rating curve or gaging station [R]
Specific conductance: Measured in micromhos/cm in field; then adjusted to 25degC by equation (1.8813774452 - [0.050433063928 * field temp] + [0.00058561144042 * field temp^2]) * Field specific conductance
Turbidity values are reported from the sample using a desktop turbidimeter and do not reflect laboratory analysis and results

Station Observer Log:
Alum Creek at Truckee River (AC@TR)

Site Conditions				Streamflow					Water Quality Observations									Remarks
Date/Time (observer time)	Observer	Stage	Hydrograph	Streamflow	Streamflow Source	Estimated Accuracy	High-water Mark	HWM date?	Water Temperature	Field Specific Conductance	Adjusted Specific Conductance	Dissolved Oxygen	Dissolved Oxygen	pH	Turbidity	Samples collected?		
		(feet)	(R/F/S/B)	(cfs)	(M, R)	(e/g/f/p)	(feet)	(M/D/YY)	(oC)	(µmhos/cm)	(at 25 oC)	(%)	(mg/L)		(NTU)	(yes/no)		
2018-08-02 17:05	bt,jj	0.54	B	0.82	M	g	--	--	23.5	378	390	83	6.2	8.21	--	no		Water clear; lots of fine sediment in the streambed just upstream of gage pool; gage location still in a riffle; logger muddy upon removal from well
2018-08-09 12:14	bt,jj	0.49	B	--	--	--	--	--	22.2	354	374	86	6.6	8.26	--	no		Removed loggers from well at 12:17 to move upstream to new gage AC@MC; note that water quality parameters were different from upstream gage
2018-09-05 8:51	bt	0.57	B	1.07	M	g	--	--	16.3	295	354	105	9.0	7.94	12.67	yes		Water clear; low flow; gage pool is a riffle
2019-01-17 12:30	bkh, tg	--	R	3.98	M	f	--	--	1.5	242	439	98	11.8	7.48	34.95	yes		Water slightly turbid; over 1" in watershed, snow levels down to 5500'; measured flow and collected sample (12:35); HWMs along channel/snow suggest much higher flow; peak likely around midnight; measured flow upstream at new gage at 12:15.
2019-02-02 9:51	bkh, tg	0.95	R	5.27	M	f	--	--	4.8	379	618	94	10.4	7.55	23.16	yes		Sample collected
2019-03-19 9:19	bt	0.46	B	1.83	M	g/f	--	--	4.5	395	649	98	10.9	8.22	25.64	yes		Sample collected at 9:05; duplicate sample processed and marked AC@MAC 8:30; water is milky; some erosion downstream at old gage; HWM top of staff plate

Observer Key: (bkh) is Brian Hastings, (bt) is Ben Trustman, (tg) is Teresa Garrison, (jj) is Jack Jacque
Stage: Water level observed on staff plate,
Hydrograph: Describes stream stage as rising (R), falling (F), steady (S), or baseflow (B
Streamflow Source: measured by a hydrologist (M), obtained from an existing rating curve or gaging station [F
Specific conductance: Measured in micromhos/cm in field; then adjusted to 25degC by equation (1.8813774452 - [0.050433063928 * field temp] + [0.00058561144042 * field temp^2]) * Field specific conductanc
Turbidity values are reported from the sample using a desktop turbidimeter and do not reflect laboratory analysis and resul

Station Observer Log:
Alum Creek at Truckee River (AC@MD)

Alum Creek at Mayberry Drive

Site Conditions				Streamflow					Water Quality Observations								Remarks
Date/Time (observer time)	Observer	Stage	Hydrograph	Streamflow	Streamflow Source	Estimated Accuracy	High-water Mark	HWM date?	Water Temperature	Field Specific Conductance	Adjusted Specific Conductance	Dissolved Oxygen	Dissolved Oxygen	pH	Turbidity	Samples collected?	
		(feet)	*(R/F/S/B)*	*(cfs)*	*(M, R)*	*(e/g/f/p)*	*(feet)*	*(M/D/YY)*	*(oC)*	*(µmhos/cm)*	*(at 25 oC)*	*(%)*	*(mg/L)*		*(NTU)*	*(yes/no)*	
2018-10-25 10:44	jj	4.03	U	0.36	M	--	--	--	--	--	--	--	--	--	--	no	Re-installation of gage downstream of old gage and closer to Mayberry; gage located ≈ 200ft upstream of culvert under Mayberry; Stage rose significantly during installation (~.1-.3') although no rainfall had occurred in several days. Water was murky but could still see stream bed. Leaves on the willows were yellow and falling into stream.
2018-11-21 19:00	bkh	3.88	F	--	--	--	--	--	--	--	--	--	--	--	--	no	Removed leaf dam causing stage to fall from 3.95; no rain yet but 0.25 inches predicted
2018-11-26 12:25	bt	3.80	U	0.04	M	g/f	--	--	4.10	626	1042	88	9.8	7.85	--	no	Baseflow; lot of leaves on side banks and in stream; flow is not moving leaves in channel; pool downstream in boulders looks like there is no flow
2018-11-29 12:50	bt, jj	4.21	U	0.98	M	g	--	--	5.80	496	785	96	10.1	7.91	--	no	Elevated flow from overnight rain; no leaf dams; rain stopped at 8 am; water slightly turbid
2018-12-04 11:45	bkh	3.89	S		--	--	4.10	2018-11-28	2.10	548	974	107	12.8	7.92	--	no	Drive by while in Reno; cloudy, snow flurries; some ice along channel, no leaf dams, water clear.
2018-12-13 15:00	bt	3.89	S	0.12	M	g/f	--	--	3.00	588	1012	93	10.7	7.88	--	--	Water clear; low flow; no leaf build-up; no rain in last two weeks
2019-01-10 13:51	bt,jj	4.01	S	0.32	M	g	--	--	3.40	499	849	106	12.3	8.11	--	no	Low flow; water clear; 1 inch patches of snow on banks and around park
2019-01-17 12:10	bkh, tg	4.54	S	4.35	M	f	5.00	2019-01-17	1.50	243	439	98	11.8	7.48	--	no	Falling limb; rain/snow, peak occurred near midnight; over 1" rainfall, snow level is now at valley floor; water slightly turbid; collected sample at downstream location (AC@TR).
2019-01-22 15:08	bt	4.26	S	1.81	M	g	6.60	2019-01-17	4.00	466	778	108	12.2	7.99	--	no	Water clear; some sand deposits on right bank and right side of channel from recent storm flows
2019-02-02 9:40	tg, bkh	4.50	S	4.70	M	g	--	--	4.80	416	876	95	10.5	7.62	91.53	yes	Moderate rain; elevated stage; slightly turbid; rain expected all day.
2019-02-13 14:30	bt, bkh	5.08	R	16.42	M	f	--	during measurement	0.70	222	416	104	12.7	7.06	--	no	Heavy rain/snow; highest flow observed; more rain expected through tomorrow; peak happened while at gage
2019-02-19 15:00	bkh	4.335	F	2.05	M	g	6.80	2019-02-14	4.00	361	603	106	11.7	8.11	--	no	Cloudy, 31 deg F., 4" snow on ground, no ice in channel; debris racked up against gage, but not affecting stage; removed and noted HWM; channel banks look scoured; potential stage shift during 2/14/19 high flows. Downloaded
2019-03-19 9:59	bt	4.290	S	1.62	M	g	--	--	5.10	403	649	96	10.5	7.69	--	yes	Water milky; water flowing over downstream control; sample collected at AC@TR site
2019-04-03 10:45	bt	4.48	F	2.52	M	g	6.80	2019-02-14	6.50	291	450	104	11.1	7.64	--	no	Elevated stage; slightly turbid; trees not leafing out yet; cool March; grade control stable in pool
2019-06-21 9:39	jj	4.260	U	1.00	M	g	--	--	17.10	433	510	94	7.9	8.11	--	no	Water slightly turbid; no significant changes to channel; gage is in good condition; downloaded PT

Observer Key: (bkh) is Brian Hastings, (bt) is Ben Trustman, (tg) is Teresa Garrison, (jj) is Jack Jacque
Stage: Water level observed on staff plate,
Hydrograph: Describes stream stage as rising (R), falling (F), steady (S), or baseflow (B
Streamflow Source: measured by a hydrologist (M), obtained from an existing rating curve or gaging station [F
Specific conductance: Measured in micromhos/cm in field; then adjusted to 25degC by equation (1.8813774452 - [0.050433063928 * field temp] + [0.00058561144042 * field temp^2]) * Field specific conductanc

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Station Observer Log:
Chalk Creek at Chalk Bluff (CC@CB)

Site Conditions				*Streamflow*					*Water Quality Observations*									*Remarks*
Date/Time (observer time)	Observer	Stage	Hydrograph	Streamflow	Streamflow Source	Estimated Accuracy	High-water Mark	HWM date?	Water Temperature	Field Specific Conductance	Adjusted Specific Conductance	Dissolved Oxygen	Dissolved Oxygen	pH	Turbidity	Samples collected?	
		(feet)	*(R/F/S/B)*	*(cfs)*	*(M, E)*	*(e/g/f/p)*	*(feet)*	*(M/D/YY)*	*(oC)*	*(µmhos/cm)*	*(at 25 oC)*	*(%)*	*(mg/L)*		*(NTU)*	*(yes/no)*	
2018-08-02 18:50	bt	3.57	B		M	f	--	--	20.2	2608	2882	73	5.6	8.22	--	no	Lots of vegetation in the channel; water clear; wasp nest in the top of the stilling well attached to the logger string-used raid and removed; removed well to clear out sediment at 19:36 (stage 3.57) re-installed at 19:40; re-inserted in-situ logger at 19:42
2018-08-09 10:08	bt,jj	3.62	B	--	--	--	--	--	16.4	2326	2785	79	6.7	8.12	--	no	Downloaded solinst backup level logger
2018-09-05 10:00	bt	3.76	B	0.61	M	f			15.0	2175	2688	75	6.6	8.19	--	yes	Water clear, veg verdant and abundant aquatic veg on water surface; ambient sampling; sample collected at 10:20
2018-09-07 16:32	bt	3.73	B	--	--	--	--	--	--	--	--	--	--	--	--	no	Installed new In-Situ loggers launched at 17:00
2018-10-01 15:40	bt	3.76	B	--	--	--	--	--	15.0	2287	2828	103	8.9	8.17	--	no	Removed old In-Situ logger SN184993 at 15:48; vegetation still overgrown around channel; white top dying out
2018-12-13 15:36	bt	3.71	B	0.57	M	g/f	--	--	4.9	1589	2576	93	10.2	8.43	--	no	Water clear; vegetation is dead and dry; low flow; measurement taken downstream in channel; loggers not stuck in sediment
2019-01-10 13:10	bt,jj	3.74	B	0.90	M	g/f	--	--	4.5	1297	2134	114	12.8	8.12	--	no	Lots of new sediment in gage pool on downstream end of left bank; water clear; some snow on stream banks 1-2 inches; evidence of over bank flow from 12/24 storm but hard to identify high water marks; downloaded baro for Yori Drain data work
2019-01-17 13:50	bkh, tg	4.68	F	13.68	M	f	6.40	2019-01-17	2.6	516	900	98	11.5.	7.92	51.8	yes	Over 1.5" of rain in 36 hours; falling limb; peak likely occurred near midnight; water turbid with foam;
2019-01-18 10:10	bt	3.88	F	--	--	--	--	--	--	--	--	--	--	--	--	no	Water slightly turbid; downloaded baro logger to process YD@SBC back up levelogger
2019-01-22 15:45	bt	3.85	S	1.13	M	g	--	--	4.30	1941	3215	106	11.8	8.14	--	no	Sunny, 50 deg. Accumulated sediment in gaging pool, removed stilling well to clean out sediment and logger; download.
2019-02-02 9:10	tg, bkh	4.65	F	13.70	M	g/f	--	--	5.30	837	1342	98	10.6	7.84	64.9	yes	Moderate rain; rain since 4am; elevated stage very turbid with abundant foam; collected sample at 9:00am
2019-02-13 15:15	bkh, bt	5.50	S	29.8	M	f	5.70	2019-02-13	1.80	326	586	104	12.5	7.36	--	no	High flow measurement; turbulent, foam, turbid, upstream weir completely overwhelmed; more rain predicted for evening
2019-02-19 15:45	bkh	4.03	S	3.40	M	g	6.70	2019-02-14	5.50	2083	3244	89	9.5	8.28	--	no	Cloudy, 31 deg F., elevated stage, some foam in water, 2-3" of snow on banks; no ice affecting flow; sediment frozen in stilling well, but above logger; removed stilling well at 15:50, cleaned and replaced at 16:00 (re-calibration).
2019-03-19 10:45	bt	3.83	B	1.29	M	g	6.40	2019-02-14	7.90	2308	3428	113	11.3	8.59	0.47	yes	Clear water; cleared out loose sediment near gage; ambient sample collected
2019-04-03 15:00	bkh	3.83	B	1.28	M	g			12.50	2274	3000	119	10.9	8.50	--	no	Water clear, algae in channel; gage in good condition
2019-06-21 16:37	jj	3.42	B	0.66	M	g	--	--	19.60	2690	2996	99	7.8	8.93	--	no	Water clear. Significant vegetation in stream may be blocking som flow downstream of gage. New beaver dam upstream of gage ~3'. Evidence of recent activity, willow chews.

Observer Key: (bkh) is Brian Hastings, (bt) is Ben Trustman, (tg) is Teresa Garrison, (jj) is Jack Jacquet

Stage: Water level observed on staff plate,

Hydrograph: Describes stream stage as rising (R), falling (F), steady (S), or baseflow (B)

Streamflow Source: measured by a hydrologist (M), obtained from an existing rating curve or weir equation [E]; V-notch weir equation used: Q = ; Rectangular weir equation = Q = 3.33LH^1.5

Specific conductance: Measured in micromhos/cm in field; then adjusted to 25degC by equation (1.8813774452 - [0.050433063928 * field temp] + [0.00058561144042 * field temp^2]) * Field specific conductance

Turbidity values are reported from the sample using a desktop turbidimeter and do not reflect laboratory analysis and results

Station Observer Log:
Steamboat Creek at Rhodes Road (SBC@RR)

Site Conditions				*Streamflow*					*Water Quality Observations*									*Remarks*
Date/Time (observer time)	Observer	Stage	Hydrograph	Streamflow	Streamflow Source	Estimated Accuracy	High-water Mark	HWM date?	Water Temperature	Field Specific Conductance	Adjusted Specific Conductance	Dissolved Oxygen	Dissolved Oxygen	pH	Turbidity	Samples collected?		
		(feet)	*(R/F/S/B)*	*(cfs)*	*(M, R)*	*(e/g/f/p/a)*	*(feet)*	*(M/D/YY)*	*(oC)*	*(µmhos/cm)*	*(at 25 oC)*	*(%)*	*(mg/L)*		*(NTU)*	*(yes/no)*		
2018-09-04 12:00	bt	1.08	B	7.1	USGS	a	--	--	18.4	455	621	107	8.8	8.14	13	yes		Ambient sample collected at 12:02; water brown and low flow
2019-01-17 10:05	bt	1.54	F	29.7	USGS	a	--	--	2.9	157	273	111	12.6	8.14	62	yes		Grab sample collected at 10:10; stage is falling as second wave of storm approaches; water is brown and turbid; evidence of overbank flow at peak flow
2019-02-02 12:00	tg, bkh	1.37	R	21.1	USGS	a	--	--	5.6	187	299	89	9.6	7.75	48	yes		Moderate rain; slightly turbid; USGS gage weir is damaged; confirmed with USGS that rating curve/flow is still accurate at gage.
2019-03-18 15:30	bt	1.40	S	36.1	USGS	a	--	--	12.3	278	366	97	9	8	48	yes		Sample collected at 15:40; water brown

Observer Key: (bkh) is Brian Hastings, (bt) is Ben Trustman, (tg) is Teresa garrison

Stage: Water level observed on staff plate,

Hydrograph: Describes stream stage as rising (R), falling (F), steady (S), or baseflow (B)

Streamflow Source: measured by a hydrologist (M), obtained from an existing rating curve or gaging station [R]

Specific conductance: Measured in micromhos/cm in field; then adjusted to 25degC by equation (1.8813774452 - [0.050433063928 * field temp] + [0.00058561144042 * field temp^2]) * Field specific conductance

Turbidity values are reported from the sample using a desktop turbidimeter and do not reflect laboratory analysis and results

Station Observer Log:
Steamboat Creek at the Narrows (SBC@NAR)

Site Conditions				***Streamflow***					***Water Quality Observations***								***Remarks***
Date/Time (observer time)	Observer	Stage	Hydrograph	Streamflow	Streamflow Source	Estimated Accuracy	High-water Mark	HWM date?	Water Temperature	Field Specific Conductance	Adjusted Specific Conductance	Dissolved Oxygen	Dissolved Oxygen	pH	Turbidity	Samples collected?	
		(feet)	*(R/F/S/B)*	*(cfs)*	*(M, R)*	*(e/g/f/p/a)*	*(feet)*	*(M/D/YY)*	*(oC)*	*(µmhos/cm)*	*(at 25 oC)*	*(%)*	*(mg/L)*		*(NTU)*	*(yes/no)*	
2018-09-04 13:14	bt	-0.06	R	13.5	USGS	a	--	--	27.4	1242	1189	133	9.3	8.51	11	yes	Ambient sample collected at 13:19; lots of irrigation on flood plain; water quality in ponded water on flood plain T 29.4°C, C 1615, SC 1492, pH 8.42; water in channel clear; low flow
2019-01-17 11:00	bt	2.72	F	338.0	USGS	a	--	--	3.4	251	427	99	11.2	8.16	415	yes	Widespread flooding over bank both upstream and downstream of bridge; water is very turbid; rain has increased since 10:00; sample collected at 11:10
2019-02-02 12:40	bkh, tg	0.59	R	44.5	USGS	a	--	--	7.0	616	944	93	9.8	8.20	162	yes	Rain ending (temporarily?); turbid; possible near peak flow;
2019-03-18 14:25	bt	0.77	B	53.8	USGS	a	--	--	17.2	551	648	162	13.4	9.08	27	yes	Water brown; some debris racked up on USGS probe and large pipe on other side of the channel; sample collected at 14:30

Observer Key: (bkh) is Brian Hastings, (bt) is Ben Trustman, (tg) is Teresa Garrison

Stage: Water level observed on staff plate,

Hydrograph: Describes stream stage as rising (R), falling (F), steady (S), or baseflow (B)

Streamflow Source: measured by a hydrologist (M), obtained from an existing rating curve or gaging station [R]

Specific conductance: Measured in micromhos/cm in field; then adjusted to 25degC by equation (1.8813774452 - [0.050433063928 * field temp] + [0.00058561144042 * field temp^2]) * Field specific conductance

Turbidity values are reported from the sample using a desktop turbidimeter and do not reflect laboratory analysis and results

Station Observer Log:
Steamboat Creek at Clean Water Way (SBC@CWW)

Site Conditions				Streamflow					Water Quality Observations									Remarks
Date/Time (observer time)	Observer	Stage	Hydrograph	Streamflow	Streamflow Source	Estimated Accuracy	High-water Mark	HWM date?	Water Temperature	Field Specific Conductance	Adjusted Specific Conductance	Dissolved Oxygen	Dissolved Oxygen	pH	Turbidity	Samples collected?		
		(feet)	*(R/F/S/B)*	*(cfs)*	*(M, R)*	*(e/g/f/p)*	*(feet)*	*(M/D/YY)*	*(oC)*	*(µmhos/cm)*	*(at 25 oC)*	*(%)*	*(mg/L)*		*(NTU)*	*(yes/no)*		
2018-08-02 14:49	bt,jj	4.73	B	49.6	USGS	a	--	--	27.8	681	647	129	8.9	8.94	--	no		Water very turbid and brown; checked new JOBOX installed by NDOT
2018-08-09 16:15	bt,jj	4.46	B	34.4	USGS	a	--	--	28.3	746	702	110.2	7.4	8.61	--	no		Calibrated the ISCO 6712 with 30 ft of hose and 15 ft of head to pull 900 ml sample; set preliminary program but need to adjust for sampling; no visible evidence of snake under the jobox
2018-09-04 10:08	bt	4.44	B	33.9	USGS	a	--	--	20.2	665	732	84.2	6.6	8.46	--	no		Set ISCO to sample using logger link 400ml every hour starting at 12:0
2018-09-05 15:27	bt,nb	4.49	B	36.6	USGS	a	--	--	--	--	--	--	--	--	--	no		Error in sampling; only one sample collected; tested ISCO for suction; power failure; changed battery and suction operated ok; disconnected ISCO from Campbell and connected to new battery; set to sample 500ml every hour starting 9/6/18 at 12:00
2018-09-07 13:40	bt	4.41	B	32.4	USGS	a	--	--	24.8	756	758	112.1	8.45	8.5	47.49, 38.88, 41.66, 26.98	yes		Process 24 samples for ambient sampling; SBC@CWW (1) T 14.6°C, C 537, SC 670, DO 82% 7.25 mg/l, pH 8.53, SBC@CWW (2) T 15.5°C, C 524, SC 639, DO 79% 6.96 mg/l, pH 8.54, SBC@CWW (3) T 16.8°C, C 584, SC 693, DO 79% 6.72 mg/l, pH 8.44, SBC@CWW (4) T20.3°C C 687, SC 755, DO 73% 5.80 mg/l, pH 8.45; tested ISCO with telemetry-indicated bottle change but no sample (pump not initiated)
2018-10-01 9:00	bt	4.49	B	37.1	USGS	a	--	--	15.9	601	727	104.2	9	8.35	--	no		Troubleshooting ISCO/telemetry with Michael Pook and Chris Katophtis from NDOT; low power on NDOT batteries; spoke to Michael about slowing down the sampling rate for turbidity to conserve power; consider using separate battery for ISCO sampling events; tested ISCO and confirmed operation via telemetry
2019-01-16 15:50	bt	5.61	R	120	USGS	a	--	--	6.6	413	636	91.5	9.51	8.19	88.78	yes		Grab sample collected for first flush using ISCO at 16:00; set ISCO via logger link to sample every hour starting at 17:00; rain started at 16:17; returned at 17:30 to verify that sample was collected
2019-01-18 13:55	bt	5.97	F	155	USGS	a	--	--	4.9	306	497	86	9.5	8.1	180.4, 590.2, 256.6			24 samples collected; collected an additional falling limb sample on site; processed composite samples: SBC@CWW (2) T 2.8°C, C 277, SC 480, DO 89% 10.4mg/l pH8.21; SBC@CWW (3) T 2.9°C, C 210, SC 365, DO 85% 9.8mg/l pH 8.39; SBC@CWW (4) T 4.9°C, C 306, SC 497, DO 86% 9.5mg/l, pH 8.10; evidence of flows on floodplain upstream on right bank; water brown
2019-02-01 13:07	bt	4.73	S	49.5	USGS	a	--	--	7	543	827	98	10.2	8.23	--	no		Added bottles to ISCO and iced; set ISCO to sample via logger link starting at 03:00 on 2/2/19 sampling every hour
2019-02-02 17:20	tg, bkh	6.15	F	170	USGS	a	--	--	7.6	349	522	85	8.7	8.04	34.43, 50.31, 56.52, 65.83	yes		Peak flow may have just occurred; collected manual sample to represent falling limb (immediately after peak). No backwatering from Truckee River
2019-03-18 11:54	bt	5.24	B	92	USGS	a	--	--	9.5	434	616	109	10.78	8.27	--	no		Filled ISCO with bottles and iced; set to sample every hour 450ml samples; verified first sample collected at 12:00; water brown; soil at bottom of stairs under bridge still wet
2019-03-19 13:58	bt	5.34	B	100	USGS	p	--	--	11.6	441.5	593.5	109	10.2	8.63	34.56, 20.60, 43.26, 21.91	yes		Process 24 samples for ambient sampling; SBC@CWW (1) T 7.5°C, C 415, SC 622.9, DO 76% 7.76 mg/l, pH 8.75, SBC@CWW (2) T 8.0°C, C 409.9, SC 606.1, DO 78% 7.90 mg/l, pH 8.90, SBC@CWW (3) T 8.5°C, C 413.9, SC 604.2, DO 77% 7.72 mg/l, pH 8.84, SBC@CWW (4) T 10.7°C C 436.6, SC 600.8, DO 77% 7.30 mg/l, pH 8.60;

Observer Key: (bkh) is Brian Hastings, (bt) is Ben Trustman, (jj) is Jack Jacquet, (tg) is Teresa Garrison, (nb) is Nick Brothers City of Reno

Stage: Water level observed on staff plate,

Hydrograph: Describes stream stage as rising (R), falling (F), steady (S), or baseflow (B)

Streamflow Source: measured by a hydrologist (M), obtained from an existing rating curve or gaging station [R]

Specific conductance: Measured in micromhos/cm in field; then adjusted to 25degC by equation (1.8813774452 - [0.050433063928 * field temp] + [0.00058561144042 * field temp^2]) * Field specific conductance

Turbidity values are reported from the sample using a desktop turbidimeter and do not reflect laboratory analysis and results

Preliminary and subject to revision

Station Observer Log:
North Truckee Drain at Big Fish Dr (NTD@BFD)

Site Conditions				***Streamflow***					***Water Quality Observations***								***Remarks***
Date/Time (observer time)	Observer	Stage *(feet)*	Hydrograph *(R/F/S/B)*	Streamflow *(cfs)*	Streamflow Source *(M, R)*	Estimated Accuracy *(e/g/f/p)*	High-water Mark *(feet)*	HWM date? *(M/D/YY)*	Water Temperature *(oC)*	Field Specific Conductance *(μmhos/cm)*	Adjusted Specific Conductance *(at 25 oC)*	Dissolved Oxygen *(%)*	Dissolved Oxygen *(mg/L)*	pH	Turbidity *(NTU)*	Samples collected? *(yes/no)*	
2018-08-09 17:05	bt,jj	3.82	B	3.27	USGS	a	--	--	25.3	949	944	83	5.9	8.15	--	no	Powered up ISCO; tested pump and system; water brown and turbic
2018-09-04 10:47	bt	3.83	B	2.94	USGS	a	--	--	16.7	773	919	73	6.2	7.99	--	no	Set ISCO to sample 500ml, calibrated to half a bottle, hourly starting at 12:00
2018-09-05 14:36	bt,nb	3.87	B	3.16	USGS	a	--	--	21.5	948	1020	82	6.4	8.13	28.64, 34.61, 34.55, 29.96	yes	Ambient samples collected every hour for 24 hours (NTD@BFD(1)): T 21.7°C, C 902, SC 962, DO 90% 6.95 mg/L , pH 8.34; (NTD@BFD (2)): T 22.8°C, C 911, SC 951, DO 87% 6.54 mg/L, pH 8.23; (NTD@BFD (3)): T 23.5°C, C 916, SC 942, DO 68% 5.03 mg/L, pH 8.06; (NTD@BFD(4)): T 24.5°C, C 978, SC 987, DO 69% 5.05 mg/L, pH 8.02
2019-01-16 16:31	bt	3.92	F	20.70	USGS	a	--	--	5.3	345	552	98	10.4	8.22	115.40	yes	Grab sample collected using ISCO for first flush at 16:40; set ISCO to start sampling every 45 minutes starting at 17:00; rain increasing at 16:50; water is brown
2019-01-17 13:00	bt	5.08	F	62.20	USGS	a	--	--	3.7	416	702	88	9.9	8.15	112.1, 198.8, 346.3	yes	24 samples collected; processed the rising limb, peak and falling limb composites: NTD@BFD (2) T 2.4°C, C 215, SC 379, DO 87% 10.06mg/l, pH 8.54; NTD@BFD (3) T 2.5°C, C 92, SC 161, DO 89% 10.40mg/l, pH 8.37; NTD@BFD (4) T 2.7°C, C 263, SC 458, DO 83% 9.56mg/l, pH 8.08; water very turbid and light browr
2019-02-01 12:06	bt	2.60	S	3.32	USGS	a	--	--	6.9	1017	1555	108	11.1	8.31	--	no	Stream is extremely low; USGS staff plate is dry; intake is 8-12 inches above the water; battery on site 12.4V; lowered intake into water; set ISCO to start at 03:00 on 2/2/19 sampling every 30 minutes; water is brown
2019-02-02 14:30	tg, bkh	4.95	F	56.80	USGS	a	--	--	6.1	145	227	84	8.8	8.02	--	yes	Still rising or peaking; ISCO just collected last sample; will return to collect falling limb and composite.
2019-02-02 15:10	tg, bkh	4.81	F	50.90	USGS	a	--	--	--	--	--	--	--	--	26.73, 96.73, 109.7, 176.0	yes	Falling limb; collected manual sample; composited samples; rain ended.
2019-03-18 11:14	bt	3.51	B	4.16	USGS	a	--	--	8.5	1122	1638	116	11.6	7.98	--	no	Changed battery and loaded ISCO with bottles; set to sample 400 ml every hour for ambient WQ sampling starting at 12:00; water is brown with lots of algae; USGS staff plate is dry
2019-03-19 12:55	bt	3.45	B	3.70	USGS	a	--	--	12.0	1233	1641	198	18.2	9.00	65.30, 29.49, 21.31, 12.75	yes	Ambient samples collected every hour for 24 hours (NTD@BFD(1)): T 6.0°C, C 1029, SC 1616, DO 104% 10.90 mg/L , pH 8.94; (NTD@BFD (2)): T 8.2°C, C 1082, SC 1593, DO94% 9.32 mg/L, pH 9.08; (NTD@BFD (3)): T 9.6°C, C 1144, SC 1621, DO 80% 7.70 mg/L, pH 8.83; (NT@BFD (4)) T 10.5°C, C 1194, SC 1651, DO 77% 7.28 mg/L, pH 8.64

Observer Key: (bkh) is Brian Hastings, (bt) is Ben Trustman, (tg) is Teresa Garrison, (jj) is Jack jacquet, (nb) is Nick Brothers

Stage: Water level observed on staff plate,

Hydrograph: Describes stream stage as rising (R), falling (F), steady (S), or baseflow (B)

Streamflow Source: measured by a hydrologist (M), obtained from an existing rating curve or gaging station [R]

Specific conductance: Measured in micromhos/cm in field; then adjusted to 25degC by equation (1.8813774452 - [0.050433063928 * field temp] + [0.00058561144042 * field temp^2]) * Field specific conductance

Turbidity values are reported from the sample using a desktop turbidimeter and do not reflect laboratory analysis and results

Station Observer Log:
North Truckee Drain at Orr Ditch (NTD@ORD); USGS 10348245

Site Conditions					***Streamflow***					***Water Quality Observations***									***Remarks***
Date/Time (observer time)	Observer	Stage *(feet)*	Hydrograph *(R/F/S/B)*	Rainall *(in.)*	Streamflow *(cfs)*	Streamflow Source *(M, R)*	Estimated Accuracy *(e/g/f/p)*	High-water Mark *(feet)*	HWM date? *(M/D/YY)*	Water Temperature *(oC)*	Field Specific Conductance *(µmhos/cm)*	Adjusted Specific Conductance *(at 25 oC)*	Dissolved Oxygen *(%)*	Dissolved Oxygen *(mg/L)*	pH	Turbidity *(NTU)*	Samples collected? *(yes/no)*	
2018-09-04 11:05	bt	1.78	B	--	3.7	USGS	a	--	--	17.1	807	950	112	9.5	7.92	7	yes	Ambient sample collected at 11:08; water clear
2019-01-17 11:40	bt	2.59	F	0.01	37.9	USGS	a	--	--	3.7	572	966	95	10.7	8.38	149	yes	Water very turbid and light brown; grab sample collected at 11:50 and processed a duplicate sample labeled NTD@OKC 12:30
2019-02-02 13:10	bkh, tg	2.44	F	--	15.1	USGS	a	--	--	5.7	268	425	87	9.4	8.22	115	yes	Rain ended; slightly turbid; very high flow; possible peak flow, no visible HWM.
2019-03-18 16:13	bt	1.69	B	--	1.8	USGS	a	--	--	13.6	1358	1736	248	22.1	9.15	10	yes	DO seems really high--had changed the membrane earlier in the day and used all day; sample collected at 16:20; lots of bank erosion upstream of gage; HWM almost at road

Observer Key: (ds) is David Shaw, (bkh) is Brian Hastings, (cs) is Collin Strasenburgh, (jo) is Jonathan Owens, (pk) is Peter Kulchawik, (bt) is Ben Trustman, (tg) is Teresa Garrison, (jj) is Jack Jacquet

Stage: Water level observed on staff plate,

Hydrograph: Describes stream stage as rising (R), falling (F), steady (S), or baseflow (B)

Streamflow Source: measured by a hydrologist (M), obtained from an existing rating curve or gaging station [R]

Specific conductance: Measured in micromhos/cm in field; then adjusted to 25degC by equation (1.8813774452 - [0.050433063928 * field temp] + [0.00058561144042 * field temp^2]) * Field specific conductance

Turbidity values are reported from the sample using a desktop turbidimeter and do not reflect laboratory analysis and results

Station Observer Log:
Boynton Slough at Steamboat Creek (BS@SBC)

Site Conditions					Streamflow					Water Quality Observations								Remarks
Date/Time (observer time)	Observer	Old Stage (feet)	New Stage (feet)	Hydrograph (R/F/S/B)	Streamflow (cfs)	Streamflow Source (M, R)	Estimated Accuracy (e/g/f/p)	High-water Mark (feet)	HWM date? (M/D/YY)	Water Temperature (oC)	Field Specific Conductance (µmhos/cm)	Adjusted Specific Conductance (at 25 oC)	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	pH	Turbidity (NTU)	Samples collected? (yes/no)	
2018-08-02 12:23	bt,jj	--	4.26	S	17.01	M	g/e	--	--	25.6	382	379	88	6.4	8.42	--	no	Water brown; lots of dragonflies feeding on floating algae; large carp; installed tubing in NDOT ISCO 6700
2018-08-09 14:03	bt,jj	--	4.28	B	--	--	--	--	--	--	--	--	--	--	--	--	no	Hooked up ISCO hose; was unable to test ISCO because the display was too hot (104°F outside temperature); visual inspection of downstream control on Boynton Slogh and Steamboat Creek ≈2 ft. of freeboard at concrete dam
2018-08-23 10:33	bt	--	4.25	B	--	--	--	--	--	21.1	307	332	107	8.5	8.38	--	no	Display on ISCO is not working; can power up and hear response sounds but no display; contacted NDOT about fixing or replacement; NDOT WQ readings : T 21.1°C, SC 343.8, DO 119.7% 8.89 mg/l, pH 8.98
2018-09-04 8:47	bt	--	4.27	B	--	--	--	--	--	19.7	322	358	69	5.5	7.93	--	no	Configured ISCO 3700 for ambient sampling and calibrated to collect 400ml using 29 feet of hose and 10 feet of head; water brown
2018-09-05 12:03	bt, nb	--	4.30	B	--	--	--	--	--	21.6	323	345	67	5.1	7.92	7.04, 6.58, 9.52, 10.01	yes	24 ambient samples collected; separated into four composite bottles; BS@SBC (1) T 18.9°C, C 316, SC 357, DO 77% 6.33mg/l, pH 8.41; BS@SBC (2) T 18.4°C, C 309, SC 354, DO 82% 6.75mg/l, pH 8.51; BS@SBC (1) T 19.5°C, C 312, SC 348, DO 83% 6.62mg/l, pH 8.33; BS@SBC (1) T 22.4°C, C 325, SC 342, DO 66.5% 5.06mg/l, pH 8.03
2018-10-01 11:09	bt	--	4.26	B	--	--	--	--	--	17.4	329	384	80	7.0	7.93	--	no	Tested ISCO 6700 provided by NDOT; 30ft of hose and 10ft of head, 900ml sample; need to recalibrate with sample bottle; pump operational; telemetry program was not working due to programming error; fixed by Michael Pook 10/2/18
2018-11-29 15:11	bt,jj	--	4.43	F	42.87	M	g/f	--	--	5.8	119	188	82	8.7	7.93	--	no	Flow measurement; large debris build up on NDOT sonde install; water brown; 1 foot of freeboard on spillway downstream toward Steamboat Creek-spillway looks to be flanking on right bank; rained over night but stopped at 8 am--increased flows in several tributaries
2018-12-13 10:25	bt	--	4.25	B	--	--	--	--	--	5.6	305	486	75	8.2	8.01	--	no	NDOT has cleared debris from sonde install and fixed pipe; unable to connect via logger link; was able to connect using direct connect cable through the CS I/O dock; took three attempts to connect and collect data-tables were not reading out; downloaded Campbell program; communication with NDOT later in the day-they visited site and fixed all problems; was able to connect via logger link after speaking to NDOT
2019-01-16 13:45	bt	--	4.63	R	--	--	--	--	--	8.2	320	471	89	8.9	7.94	23.3	yes	Grab sample collected for first flush at 14:00; Set ISCO via logger link to start sampling at 17:00 every 40 minutes; no debris build up at probe; water brown; no snow on ground
2019-01-17 9:00	bkh, tg, bt	--	5.94	F	267	M	f	--	--	2.1	105	186	94	11.3	7.84	--	no	Cloudy; pause in rain; over 1" of rain last 36 hrs; snow down to 5500'; flow turbid; found NDOTs station damaged from high flows; stage error; ISCO also did not collect samples as programmed; potential backwatering from SBC
2019-01-18 10:42	bt	--	4.43	F	--	--	--	--	--	4.2	205	342	97	11.0	7.66	--	no	Water brown; dumping extra samples from ISCO after NDOT installation failed-cannot construct hydrograph without accurate stage record
2019-02-01 13:38	bt	--	4.20	S	--	--	--	--	--	8.9	476	689	94	9.2	8.10	--	no	Calibrated the ISCO for a 900ml sample; tested telemetry using logger link and it failed; programmed ISCO manually to start sampling every 40 minutes at 03:00 on 2/2/19
2019-02-02 14:00	tg, bkh	--	4.83	R		M	g	--	--	8.0	275	408	80	8.2	7.87		yes	Light to moderate rain; petroleum sheen on surface and trash in flow; d/s weir exhibits drop; no backwatering; ISCO sampled 17 bottles as of 14:00; plan to return to collect additional peak/fallling limb samples
2019-02-02 15:40	tg, bkh	--	4.70	F	174.55	M	g	4.85	2019-02-02	--	--	--	--	--	--	19.37, 14.15, 44.76, 68.75	yes	Returned to collect and composite samples from ISCO; falling limb, rain has let up.
2019-02-13 13:30	bt, bkh	--	5.09	F	172	M	g	5.35	2019-02-13	3.0	131.0	228.0	102.0	12.1	7.56	--	no	No backwatering; water is slightly turbid; high water mark downstream at weir suggest flows much higher based on garbage lines (see photos)
2019-03-18 12:27	bt	--	4.32	B	--	--	--	--	--	11.2	329.0	447.0	94.0	8.9	8.67	--	no	Loaded ISCO with bottles and ice; set to collect 450 ml sample every hour starting at 13:00; fixed NDOT pipe; some debris racked up on NDOT install; lots of debris on left bank downstream at staff plate
2019-03-19 14:54	bt	--	4.34	B	--	--	--	--	--	11.4	313.3	423.8	101.0	9.5	8.30	37.17, 16.48, 23.26, 12.73	yes	24 ambient samples collected; separated into four composite bottles; BS@SBC (1) T 6.3°C, C 282.9, SC 440.8, DO 81% 8.63mg/l, pH 8.64; BS@SBC (2) T 7.0°C, C 297.7, SC 426.4 , DO 81% 8.37mg/l, pH 8.57; BS@SBC (3) T 7.6°C, C 281, SC 421.3, DO 84% 8.63mg/l, pH 8.80; BS@SBC (4) T 9.2°C, C 297.3, SC 425.7, DO 76% 7.50mg/l, pH 8.68

Observer Key: (bkh) is Brian Hastings, (bt) is Ben Trustman, (tg) is Teresa Garrison, (jj) is Jack Jacquet, (nb) is Nick Brothers City of Reno

Stage: Water level observed on staff plate,

Hydrograph: Describes stream stage as rising (R), falling (F), steady (S), or baseflow (B)

Streamflow Source: measured by a hydrologist (M), obtained from an existing rating curve or gaging station [R]

Specific conductance: Measured in micromhos/cm in field; then adjusted to 25degC by equation (1.8813774452 - [0.050433063928 * field temp] + [0.00058561144042 * field temp^2]) * Field specific conductance

Turbidity values are reported from the sample using a desktop turbidimeter and do not reflect laboratory analysis and results

Station Observer Log:
Yori Drain at Steamboat Creek (YD@SBC)

Site Conditions				*Streamflow*					*Water Quality Observations*								*Remarks*
Date/Time (observer time)	Observer	ISCO depth	Hydrograph	Streamflow	Streamflow Source	Estimated Accuracy	High-water Mark	HWM date?	Water Temperature	Field Specific Conductance	Adjusted Specific Conductance	Dissolved Oxygen	Dissolved Oxygen	pH	Turbidity	Samples collected?	
		(feet)	*(R/F/S/B)*	*(cfs)*	*(M, R)*	*(e/g/f/p)*	*(feet)*	*(M/D/YY)*	*(oC)*	*(µmhos/cm)*	*(at 25 oC)*	*(%)*	*(mg/L)*		*(NTU)*	*(yes/no)*	
2018-08-02 13:08	bt,jj	0.85	S	28.4	M	f	--	--	25.7	540	593	156	11.2	9.27	--	no	Water is turbid and green; flow is elevated from baseflow; flow too high to get velocity measurement in culvert; ran diagnostics on ISCO -all ok; downloaded ISCO; changed desiccant; stage rising during visit (ISCO reading 17.11-17.45 cfs); manual flow measurement upstream of culvert
2018-08-09 14:51	bt,jj	0.42	B	4.6	R	g	--	--	28.8	524	489	208	14.1	9.40	--	no	Manual measurement inside outlet of culvert, 0.41 ft 5.39ft/s; Isco reading 5.61 ft/s; measured top of culvert with laser level for slope of conduit;
2018-09-04 9:34	bt	0.35	B	3.7	R	p	--	--	20.5	473	517	129	10.1	9.18	--	no	Set ISCO to sample 500ml every hour starting at 12:00; some green foam at rocks on channel edge upstream of culvert
2018-09-05 12:45	bt,nb	0.37	B	3.8	R	p	--	--	24.5	520	525	170	12.5	9.25	26.10, 26.96, 22.16, 37.86	yes	24 ambient samples collected; separated into four composite bottles; YD@SBC (1) T 18.6°C, C 458, SC 522, DO 77% 6.29mg/l, pH 9.18; YD@SBC (2) T 19.6°C, C 465, SC 518, DO 80% 6.37mg/l, pH 9.18; YD@SBC (1) T 21°C, C 485, SC 524, DO 83% 6.39mg/l, pH 9.09; YD@SBC (1) T 23.2°C, C 509, SC 527, DO 77% 5.80mg/l, pH 9.05; manual depth and velocity check in culvert, depth 0.38 ft., 4.72 ft/s
2018-11-21 13:45	bt,jj	0.28	B	2.7	R	p	--	--	7.1	422	644	172	18.0	8.88	--	no	Manual velocity check at instrument: depth 0.3 velocity 4.17ft/s; loaded ISCO with 24 bottles and set to sample at 20:00 using 20 minute intervals; called NWS to confirm onset of precipitation at 20:00; forecast of 0.2 inches of precipitation
2018-11-22 12:00	pk, bkh	--	B	3.4	R	p	--	--	7.7	413	617	110	11.6	8.40	27.91, 11.69, 13.61, 23.94	yes	11 samples collected; hydrograph suggests falling limb still continuing; processed the bottles into 3 composites and loaded ISCO with clean bottles to continue sampling; YD(1): T 7.4°C, C 352, SC 529, pH 8.10, YD(2): T 8.4°C, C 372, SC 544, pH 8.06, YD(3): T 9.2°C, C 416, SC 596, pH 8.14; cleaned algae from intake with brush; reset to sample immediately at 12:45
2018-11-23 15:58	bt	0.31	B	3.2	R	g	--	--	7.4	416	628	142	14.6	8.27	--	yes	24 samples collected from 12:45 on 11/22/18 to 20:22 on 11/22/18; all samples fell within the falling limb based on stage hydrograph; YD(4): T 5.2°C, C 407.7, SC 656.5, DO 117%, 12.65 mg/l, pH 9.02
2018-12-13 11:16	bt	0.28	B	2.8	R	g	--	--	4.7	392	641	127	14.1	8.64	--	no	Signal strength from 0-25%; called Teledyne to discuss with tech support; signal strength and spectrum should be above 40%; signal strength could be probe or module issue as physical parameters at site are favorable; tested partition and that is working on ISCO
2018-12-20 11:30	bkh	0.27	B	2.6	R	g	--	--	5.6	397	630	130	15.4	8.07	--	no	Sunny, warm 50 deg F; installed backup levelogger; cleaned solar panel, signal strength still reading under 40% for ISCO 750 module.
2019-01-05 14:30	bt	0.28	B	2.7	R	g	--	--	4.2	373	618	139	15.4	8.47	--	no	Signal strength fluctuating between 17-20%-spectrum strength 70%(40% or higher recommended for both); MMB measurement at instrument 0.3ft 5.38ft/s (ISCO measuring 5.75ft/s); downloaded backup solinst logger
2019-01-10 10:10	bt,jj	0.36	B	4.2	R	g	--	--	--	--	--	--	--	--	--	no	Signal strength 7% spectrum strength 83%; spoke to Raph Townsend about removing probe to understand plate installation; removed intake hose and flow probe and module and plate that both attaché too; need to replace 7/16 nuts for re-install
2019-01-16 14:32	bt	--	R	--	--	--	--	--	7.6	362	542	87	8.8	8.00	66.9	yes	First flush sample collected at 15:15; water quality was measured in the sample; set up ISCO in temporary site upstream of the culvert; tested sample intake and volume; set ISCO to sample every 45 minutes starting at 17:00; no snow on the ground; road very muddy
2019-01-17 9:00	bt	--	F	--	--	--	--	--	4.5	177	291	88	9.7	8.36	--	no	22 samples collected; backwatering from Steamboat Creek at culvert; still evidence of positive flow from Yori Drain by plume of dark water from culvert discharge in Steamboat Creek (see photo); removed sample bottles and iced; replaced used bottles and added ice; reprogrammed to sample every 1.5 hours starting at 9:30
2019-01-18 11:15	bt	--	F	--	--	--	--	--	6.4	302	469	76	8.0	7.90	307.8, 307.4, 66.37	yes	Sampler error after reset on 1/17/19-possibly due to debris build up on sampler tube during peak flow; 25 samples collected over two days and composited: YD@SBC (2) T 3.2°C, C 104, SC 179, DO 87% 10.1mg/l, pH 8.18; YD@SBC (3) T3.2°C, C 179, SC 308, DO 85% 9.88mg/l, pH 8.19; falling limb sample collected on site(water quality is noted to left); Steamboat Creek no longer backwatering culvert; still falling limb; water level is 4-6 inches higher at the intake from install
2019-02-01 15:06	bt	--		--	--	--	--	--	8.5	481	702	68	6.7	8.00	--	no	Set up ISCO in 50 gallon drum with 16 clean bottles; set to sample every 1.25 hours starting at 03:00 on 2/2/19; adjusted the intake lower on t post and cleaned debris and algae from plastic; lots of plant debris upstream at wetland overflow
2019-02-02 16:30	bkh, tg	--	F	--	--	--	--	--	8.2	326	481	82	8.4	7.74	19.62, 29.89, 64.92, 39.35	yes	ISCO successfully sampled 11 samples on a 75 minute time-pacing; falling limb sample was collected manually at 16:38; composited samples into laboratory-provided bottles; water slightly turbid; Yori Wetland very full and spilling; no backwatering from SBC.
2019-03-18 13:15	bt	--	B	--	--	--	--	--	14.4	539	676	158	13.9	8.67	--	no	Set up ISCO in upstream sample location; programmed to collect 480 ml every hour starting at 14:00; cleaned intake tube; depth and velocity at culvert exit-13:34 0.5ft, 6.29ft/s; water clear
2019-03-19 15:53	bt	--	B	--	--	--	--	--	14.9	537	666	166	14.3	8.92	18.36, 10.01, 46.80, 13.87	yes	24 ambient samples collected; separated into four composite bottles; YD@SBC (1) T 8.9°C, C 460, SC 663.9, DO 85% 8.32mg/l, pH 8.71; YD@SBC (2) T 8.8°C, C 459.8, SC 665.2, DO 84% 8.32mg/l, pH 8.69; YD@SBC (3) T 8.0°C, C 458.1, SC 678.7, DO 81% 8.15mg/l, pH 8.59; YD@SBC (4) T 10.2°C, C 479, SC 668.3, DO 85% 8.19mg/l, pH 8.62; manual depth and velocity check in culvert, depth 0.5 ft., 6.28 ft/s

Observer Key: (bkh) is Brian Hastings, (bt) is Ben Trustman, (tg) is Teresa Garrison, (jj) is Jack Jacquet, (nb) is Nick Brothers City of Reno

Stage: Water level observed on staff plate,

Hydrograph: Describes stream stage as rising (R), falling (F), steady (S), or baseflow (B)

Streamflow Source: measured by a hydrologist (M), obtained from an existing rating curve or gaging station [R]

Specific conductance: Measured in micromhos/cm in field; then adjusted to 25degC by equation (1.8813774452 - [0.050433063928 * field temp] + [0.00058561144042 * field temp^2]) * Field specific conductance

Turbidity values are reported from the sample using a desktop turbidimeter and do not reflect laboratory analysis and results

APPENDIX B

Equipment Calibration Logs

CALIBRATION SHEET

DATE/TIME 2018-07-23

NAME Ben Trustman

SERIAL NUMBER 1692

	Buffer Standard Used	**Pre-Calibration**	**Post-Calibration**	**Cell Constant**		**Notes**	**Pass?**
SPECIFIC CONDUCTANCE (µs/cm)	100 (µs/cm)					Acceptable cell const. 4.0-6.0	
	500 (µs/cm)	568	500	4.57		Acceptable cell const. 4.0-6.0	y
	1000 (µs/cm)	923	1000	4.96		Acceptable cell const. 4.0-6.0	y
	circle one			**mV Value**	**Slope**		
pH Point #1	4.00 [✓ 7.00] 10.00	7.06	7.01	-10.6	58.27	pH 7 mV value = 0 +/- 50	
						pH 4 mV value = +165 to +180 from 7 buffer mV value	
pH Point #2	[✓ 4.00] 7.00 10.00	4.01	4	176.6		pH 10 mV value = -165 to -180 from 7 buffer mV value	
						Ideal slope is between 55 and 60	
pH Point #3	4.00 7.00 [✓ 10.00]	10.03	10.01	-172.2			
				1.25 mil yellow membrane Acceptable: 4.31 to 8.00 uA			
DISSOLVED OXYGEN (% sat)	n/a	95.5	100	4.74			
DISSOLVED OXYGEN (% sat)	n/a						

Comments or Notes

CALIBRATION SHEET

DATE/TIME 2018-08-08

NAME Ben Trustman

SERIAL NUMBER 1692

	Buffer Standard Used	Pre-Calibration	Post-Calibration	Cell Constant	Notes	Pass?
SPECIFIC CONDUCTANCE (µs/cm)	100 (µs/cm)				Acceptable cell const. 4.0-6.0	
	500 (µs/cm)	575	500	4.31	Acceptable cell const. 4.0-6.0	y
	1000 (µs/cm)	893	1000	4.83	Acceptable cell const. 4.0-6.0	y

	circle one			mV Value	Slope	
pH Point #1	4.00 [✓ 7.00] 10.00	7.12	7.01	-15.9	58.27	pH 7 mV value = 0 +/- 50
						pH 4 mV value = +165 to +180 from 7 buffer mV value
pH Point #2	[✓ 4.00] 7.00 10.00	4.1	4	175.6		pH 10 mV value = -165 to -180 from 7 buffer mV value
						Ideal slope is between 55 and 60
pH Point #3	4.00 7.00 [✓ 10.00]	10.16	10.01	-176.6		

1.25 mil yellow membrane

Acceptable: 4.31 to 8.00 uA

DISSOLVED OXYGEN (% sat)	n/a			
DISSOLVED OXYGEN (% sat)	n/a			

Comments or Notes

CALIBRATION SHEET

DATE/TIME 2018-09-18

NAME Ben Trustman

SERIAL NUMBER 1692

	Buffer Standard Used	Pre-Calibration	Post-Calibration	Cell Constant	Notes	Pass?
SPECIFIC CONDUCTANCE (µs/cm)	100 (µs/cm)				Acceptable cell const. 4.0-6.0	
	500 (µs/cm)	550	500	4.94	Acceptable cell const. 4.0-6.0	y
	1000 (µs/cm)	902	1000	4.91	Acceptable cell const. 4.0-6.0	y

	circle one			mV Value	Slope	
pH Point #1	4.00 [✓ 7.00] 10.00	7.07	7.01	-21.8	57.78	pH 7 mV value = 0 +/- 50
						pH 4 mV value = +165 to +180 from 7 buffer mV value
pH Point #2	[✓ 4.00] 7.00 10.00	4.03	4	172.8		pH 10 mV value = -165 to -180 from 7 buffer mV value
						Ideal slope is between 55 and 60
pH Point #3	4.00 7.00 [✓ 10.00]	10.09	10.03	-172		

				1.25 mil yellow membrane Acceptable: 4.31 to 8.00 uA
DISSOLVED OXYGEN (% sat)	n/a	99.3	100	4.11
DISSOLVED OXYGEN (% sat)	n/a			

Comments or Notes

DO low uA

CALIBRATION SHEET

DATE/TIME 2018-10-03

NAME Brian hastings

SERIAL NUMBER 1692

	Buffer Standard Used	Pre-Calibration	Post-Calibration	Cell Constant	Notes	Pass?
SPECIFIC CONDUCTANCE (µs/cm)	100 (µs/cm)				Acceptable cell const. 4.0-6.0	
	500 (µs/cm)	583	500	4.21	Acceptable cell const. 4.0-6.0	y
	1000 (µs/cm)	855	1000	4.92	Acceptable cell const. 4.0-6.0	y

	circle one			mV Value	Slope
pH Point #1	4.00 [✓ 7.00] 10.00				57.78
pH Point #2	[✓ 4.00] 7.00 10.00		4	149.1	
pH Point #3	4.00 7.00 [✓ 10.00]				

pH 7 mV value = 0 +/- 50

pH 4 mV value = +165 to +180 from 7 buffer mV value

pH 10 mV value = -165 to -180 from 7 buffer mV value

Ideal slope is between 55 and 60

1.25 mil yellow membrane

Acceptable: 4.31 to 8.00 uA

DISSOLVED OXYGEN (% sat)	n/a		100	3.45
DISSOLVED OXYGEN (% sat)	n/a			

Comments or Notes

DO low uA

CALIBRATION SHEET

DATE/TIME 2018-12-21
NAME Ben Trustman
SERIAL NUMBER 1692

	Buffer Standard Used	Pre-Calibration	Post-Calibration	Cell Constant	Notes	Pass?
SPECIFIC CONDUCTANCE (µs/cm)	100 (µs/cm)				Acceptable cell const. 4.0-6.0	
	500 (µs/cm)	539	500	4.56	Acceptable cell const. 4.0-6.0	y
	1000 (µs/cm)	909	1000	5.01	Acceptable cell const. 4.0-6.0	y

	circle one			mV Value	Slope	
pH Point #1	4.00 [✓ 7.00] 10.00	7	7.02	-23.9	51.98	pH 7 mV value = 0 +/- 50
pH Point #2	[✓ 4.00] 7.00 10.00	4.23	4	158.9		pH 4 mV value = +165 to +180 from 7 buffer mV value
						pH 10 mV value = -165 to -180 from 7 buffer mV value
pH Point #3	4.00 7.00 [✓ 10.00]	9.68	10.07	-150.2		Ideal slope is between 55 and 60

1.25 mil yellow membrane
Acceptable: 4.31 to 8.00 uA

DISSOLVED OXYGEN (% sat)	n/a			
DISSOLVED OXYGEN (% sat)	n/a			

Comments or Notes

pH mV off on 4 and 10 but slope OK.

CALIBRATION SHEET

DATE/TIME 2019-01-04

NAME Ben Trustman

SERIAL NUMBER 1692

	Buffer Standard Used	**Pre-Calibration**	**Post-Calibration**	**Cell Constant**		**Notes**	**Pass?**
SPECIFIC CONDUCTANCE (μs/cm)	100 (μs/cm)					Acceptable cell const. 4.0-6.0	
	500 (μs/cm)	559	500	4.47		Acceptable cell const. 4.0-6.0	y
	1000 (μs/cm)	903	1000	4.96		Acceptable cell const. 4.0-6.0	y
	circle one			**mV Value**	**Slope**		
pH Point #1	4.00 [✓ 7.00] 10.00	7.03	7.02	-21.2	57.67	pH 7 mV value = 0 +/- 50	
pH Point #2	[✓ 4.00] 7.00 10.00	3.75	4	168.1		pH 4 mV value = +165 to +180 from 7 buffer mV value	
						pH 10 mV value = -165 to -180 from 7 buffer mV value	
pH Point #3	4.00 7.00 [✓ 10.00]	10.47	10.07	-174.9		Ideal slope is between 55 and 60	
				1.25 mil yellow membrane Acceptable: 4.31 to 8.00 uA			
DISSOLVED OXYGEN (% sat)	n/a						
DISSOLVED OXYGEN (% sat)	n/a						

Comments or Notes

CALIBRATION SHEET

DATE/TIME 2019-01-15

NAME Ben Trustman

SERIAL NUMBER 1692

	Buffer Standard Used	Pre-Calibration	Post-Calibration	Cell Constant	Notes	Pass?
SPECIFIC CONDUCTANCE (µs/cm)	100 (µs/cm)				Acceptable cell const. 4.0-6.0	
	500 (µs/cm)	513	500	4.79	Acceptable cell const. 4.0-6.0	y
	1000 (µs/cm)	1007	1000	4.92	Acceptable cell const. 4.0-6.0	y

	circle one			mV Value	Slope	
pH Point #1	4.00 [✓ 7.00] 10.00	7.03	7.03	-24.8	56.14	pH 7 mV value = 0 +/- 50
pH Point #2	[✓ 4.00] 7.00 10.00	4.13	4	164.6		pH 4 mV value = +165 to +180 from 7 buffer mV value pH 10 mV value = -165 to -180 from 7 buffer mV value
pH Point #3	4.00 7.00 [✓ 10.00]	10.05	10.09	-168.6		Ideal slope is between 55 and 60

1.25 mil yellow membrane

Acceptable: 4.31 to 8.00 uA

DISSOLVED OXYGEN (% sat)	n/a	92	100	3.12
DISSOLVED OXYGEN (% sat)	n/a			

Comments or Notes

DO uA low

CALIBRATION SHEET

DATE/TIME 2019-01-22

NAME Ben Trustman

SERIAL NUMBER 1692

	Buffer Standard Used	Pre-Calibration	Post-Calibration	Cell Constant	Notes	Pass?
SPECIFIC CONDUCTANCE (µs/cm)	100 (µs/cm)				Acceptable cell const. 4.0-6.0	
	500 (µs/cm)	510	500	4.81	Acceptable cell const. 4.0-6.0	y
	1000 (µs/cm)	975	1000	4.91	Acceptable cell const. 4.0-6.0	y

	circle one			mV Value	Slope	
pH Point #1	4.00 [✓ 7.00] 10.00	7.15	7.02	-31.9	55.61	pH 7 mV value = 0 +/- 50
pH Point #2	[✓ 4.00] 7.00 10.00	4.13	4	166.6		pH 4 mV value = +165 to +180 from 7 buffer mV value pH 10 mV value = -165 to -180 from 7 buffer mV value
pH Point #3	4.00 7.00 [✓ 10.00]	10.13	10.06	-164.7		Ideal slope is between 55 and 60

1.25 mil yellow membrane
Acceptable: 4.31 to 8.00 uA

DISSOLVED OXYGEN (% sat)	n/a	94	100	3.67
DISSOLVED OXYGEN (% sat)	n/a			

Comments or Notes

DO uA low

CALIBRATION SHEET

DATE/TIME	2019-02-13
NAME	Ben Trustman
SERIAL NUMBER	1692

	Buffer Standard Used	Pre-Calibration	Post-Calibration	Cell Constant	Notes	Pass?
SPECIFIC CONDUCTANCE (µs/cm)	100 (µs/cm)				Acceptable cell const. 4.0-6.0	
	500 (µs/cm)	509	500	4.73	Acceptable cell const. 4.0-6.0	y
	1000 (µs/cm)	984	1000	4.8	Acceptable cell const. 4.0-6.0	y

	circle one			mV Value	Slope	
pH Point #1	4.00 [✓ 7.00] 10.00	6.94	7.02	-26.4	56.07	pH 7 mV value = 0 +/- 50
pH Point #2	[✓ 4.00] 7.00 10.00	3.95	4	163.7		pH 4 mV value = +165 to +180 from 7 buffer mV value pH 10 mV value = -165 to -180 from 7 buffer mV value
pH Point #3	4.00 7.00 [✓ 10.00]	10.05	10.06	-170.3		Ideal slope is between 55 and 60

1.25 mil yellow membrane
Acceptable: 4.31 to 8.00 uA

DISSOLVED OXYGEN (% sat)	n/a			
DISSOLVED OXYGEN (% sat)	n/a			

Comments or Notes

pH 4 mV value low

CALIBRATION SHEET

DATE/TIME 2019-06-03

NAME Ben Trustman

SERIAL NUMBER 1692

	Buffer Standard Used	Pre-Calibration	Post-Calibration	Cell Constant		Notes	Pass?
SPECIFIC CONDUCTANCE (µs/cm)	100 (µs/cm)					Acceptable cell const. 4.0-6.0	
	500 (µs/cm)	501	500	4.59		Acceptable cell const. 4.0-6.0	y
	1000 (µs/cm)	1044	1000	4.61		Acceptable cell const. 4.0-6.0	y
	circle one			mV Value	Slope		
pH Point #1	4.00 [✓ 7.00] 10.00	7.12	7.02	-33.6	56.07	pH 7 mV value = 0 +/- 50	
pH Point #2	[✓ 4.00] 7.00 10.00	4.16	4	163.1		pH 4 mV value = +165 to +180 from 7 buffer mV value	
						pH 10 mV value = -165 to -180 from 7 buffer mV value	
pH Point #3	4.00 7.00 [✓ 10.00]	10.27	10.05	-174		Ideal slope is between 55 and 60	
				1.25 mil yellow membrane Acceptable: 4.31 to 8.00 uA			
DISSOLVED OXYGEN (% sat)	n/a	94	100	4.6			
DISSOLVED OXYGEN (% sat)	n/a						

Comments or Notes

pH 4 mV value low

CALIBRATION SHEET

DATE/TIME 2019-01-04

NAME Ben Trustman

SERIAL NUMBER 1693

	Buffer Standard Used	Pre-Calibration	Post-Calibration	Cell Constant	Notes	Pass?
SPECIFIC CONDUCTANCE (µs/cm)	100 (µs/cm)				Acceptable cell const. 4.0-6.0	
	500 (µs/cm)	540	500	4.47	Acceptable cell const. 4.0-6.0	y
	1000 (µs/cm)	911	1000	4.91	Acceptable cell const. 4.0-6.0	y

	circle one			mV Value	Slope	
pH Point #1	4.00 [✓ 7.00] 10.00	7.06	7.02	-12	58.07	pH 7 mV value = 0 +/- 50
	circle one					pH 4 mV value = +165 to +180 from 7 buffer mV value
pH Point #2	[✓ 4.00] 7.00 10.00	3.75	4	168.5		pH 10 mV value = -165 to -180 from 7 buffer mV value
						Ideal slope is between 55 and 60
pH Point #3	4.00 7.00 [✓ 10.00]	10.54	10.06	-177.1		

1.25 mil yellow membrane
Acceptable: 4.31 to 8.00 uA

DISSOLVED OXYGEN (% sat)			100	3.34

Comments or Notes

-175.3

CALIBRATION SHEET

DATE/TIME 2019-01-15

NAME Ben Trustman

SERIAL NUMBER 1693

	Buffer Standard Used	Pre-Calibration	Post-Calibration	Cell Constant	Notes	Pass?
SPECIFIC CONDUCTANCE (µs/cm)	100 (µs/cm)				Acceptable cell const. 4.0-6.0	
	500 (µs/cm)	511	500	4.79	Acceptable cell const. 4.0-6.0	y
	1000 (µs/cm)	1002	1000	4.89	Acceptable cell const. 4.0-6.0	y

				mV Value	Slope	
	circle one					
pH Point #1	4.00 [✓ 7.00] 10.00	7.03	7.02	0.5	57.88	pH 7 mV value = 0 +/- 50
	circle one					pH 4 mV value = +165 to +180 from 7 buffer mV value
pH Point #2	[✓ 4.00] 7.00 10.00	4.09	4	152		pH 10 mV value = -165 to -180 from 7 buffer mV value
						Ideal slope is between 55 and 60
pH Point #3	4.00 7.00 [✓ 10.00]	10.12	10.05	-190.2		

1.25 mil yellow membrane
Acceptable: 4.31 to 8.00 uA

DISSOLVED OXYGEN (% sat)	83	100	3.18

Comments or Notes

pH 4 and 10 out of range but slope is OK.
DO uA is low.

-188.4

CALIBRATION SHEET

DATE/TIME 2019-01-22

NAME Ben Trustman

SERIAL NUMBER 1693

	Buffer Standard Used	**Pre-Calibration**	**Post-Calibration**	**Cell Constant**		**Notes**	**Pass?**
SPECIFIC CONDUCTANCE (µs/cm)	100 (µs/cm)					Acceptable cell const. 4.0-6.0	
	500 (µs/cm)	485.4	500	4.93		Acceptable cell const. 4.0-6.0	y
	1000 (µs/cm)	968	1000	5.09		Acceptable cell const. 4.0-6.0	y
	circle one			**mV Value**	**Slope**		
pH Point #1	4.00 7.00 10.00	7.12	7.02	-17.6	57.4	pH 7 mV value = 0 +/- 50	
						pH 4 mV value = +165 to +180 from 7 buffer mV value	
	circle one						
pH Point #2	4.00 7.00 10.00	4.16	4	169		pH 10 mV value = -165 to -180 from 7 buffer mV value	
						Ideal slope is between 55 and 60	
pH Point #3	4.00 7.00 10.00	10.16	10.04	-173.3			
				1.25 mil yellow membrane Acceptable: 4.31 to 8.00 uA			
DISSOLVED OXYGEN (% sat)		93.7	100	3.79			

Comments or Notes

DO uA low

-171.5

CALIBRATION SHEET

DATE/TIME 2019-02-13

NAME Ben Trustman

SERIAL NUMBER 1693

	Buffer Standard Used	Pre-Calibration	Post-Calibration	Cell Constant	Notes	Pass?
SPECIFIC CONDUCTANCE (µs/cm)	100 (µs/cm)				Acceptable cell const. 4.0-6.0	
	500 (µs/cm)	542	500	4.69	Acceptable cell const. 4.0-6.0	y
	1000 (µs/cm)	981	1000	4.78	Acceptable cell const. 4.0-6.0	y

	circle one			mV Value	Slope	
pH Point #1	4.00 [✓ 7.00] 10.00	6.95	7.02	-14.8	57.35	pH 7 mV value = 0 +/- 50
	circle one					pH 4 mV value = +165 to +180 from 7 buffer mV value
pH Point #2	[✓ 4.00] 7.00 10.00	4.01	4	166.4		pH 10 mV value = -165 to -180 from 7 buffer mV value
						Ideal slope is between 55 and 60
pH Point #3	4.00 7.00 [✓ 10.00]	10.13	10.06	-175.3		

1.25 mil yellow membrane

Acceptable: 4.31 to 8.00 uA

DISSOLVED OXYGEN (% sat)			

Comments or Notes

-173.5

CALIBRATION SHEET

DATE/TIME 2019-03-18

NAME Ben Trustman

SERIAL NUMBER 1693

	Buffer Standard Used	Pre-Calibration	Post-Calibration	Cell Constant	Notes	Pass?
SPECIFIC CONDUCTANCE (µs/cm)	100 (µs/cm)				Acceptable cell const. 4.0-6.0	
	500 (µs/cm)	518	500	4.61	Acceptable cell const. 4.0-6.0	y
	1000 (µs/cm)	939	1000	4.91	Acceptable cell const. 4.0-6.0	y

	circle one			mV Value	Slope	
pH Point #1	4.00 [✓ 7.00] 10.00	6.97	7.02	-14.7	56.28	pH 7 mV value = 0 +/- 50
	circle one					pH 4 mV value = +165 to +180 from 7 buffer mV value
pH Point #2	[✓ 4.00] 7.00 10.00	4.11	4	162.7		pH 10 mV value = -165 to -180 from 7 buffer mV value
						Ideal slope is between 55 and 60
pH Point #3	4.00 7.00 [✓ 10.00]	10.05	10.04	-173.1		

1.25 mil yellow membrane
Acceptable: 4.31 to 8.00 uA

DISSOLVED OXYGEN (% sat)			

Comments or Notes

PH 4 slightly out of range but slope ok

-171.3

CALIBRATION SHEET

DATE/TIME 2019-04-29

NAME Ben Trustman

SERIAL NUMBER 1693

	Buffer Standard Used	**Pre-Calibration**	**Post-Calibration**	**Cell Constant**		**Notes**	**Pass?**
SPECIFIC CONDUCTANCE (µs/cm)	100 (µs/cm)					Acceptable cell const. 4.0-6.0	
	500 (µs/cm)	524	500	4.69		Acceptable cell const. 4.0-6.0	y
	1000 (µs/cm)	960	1000	4.88		Acceptable cell const. 4.0-6.0	y
	circle one			**mV Value**	**Slope**		
pH Point #1	4.00 [✓ 7.00] 10.00	7.06	7.02	-20.2	55	pH 7 mV value = 0 +/- 50	
						pH 4 mV value = +165 to +180 from 7 buffer mV value	
	circle one						
pH Point #2	[✓ 4.00] 7.00 10.00	4.15	4	162.1		pH 10 mV value = -165 to -180 from 7 buffer mV value	
						Ideal slope is between 55 and 60	
pH Point #3	4.00 7.00 [✓ 10.00]	10.07	10.04	-163.4			
				1.25 mil yellow membrane Acceptable: 4.31 to 8.00 uA			
DISSOLVED OXYGEN (% sat)		78.7	100	4.03			

Comments or Notes

PH 10 and 4 slightly out of range but slope ok

DO uA is low

-161.6

CALIBRATION SHEET

DATE/TIME 2019-06-03

NAME Ben Trustman

SERIAL NUMBER 1693

	Buffer Standard Used	Pre-Calibration	Post-Calibration	Cell Constant	Notes	Pass?
SPECIFIC CONDUCTANCE (µs/cm)	100 (µs/cm)				Acceptable cell const. 4.0-6.0	
	500 (µs/cm)	546	500	4.48	Acceptable cell const. 4.0-6.0	y
	1000 (µs/cm)	915	1000	4.9	Acceptable cell const. 4.0-6.0	y

	circle one			mV Value	Slope	
pH Point #1	4.00 [✓ 7.00] 10.00	7.14	7.02	-27.2	54.54	pH 7 mV value = 0 +/- 50
	circle one					pH 4 mV value = +165 to +180 from 7 buffer mV value
pH Point #2	[✓ 4.00] 7.00 10.00	4.34	4	150.29		pH 10 mV value = -165 to -180 from 7 buffer mV value
						Ideal slope is between 55 and 60
pH Point #3	4.00 7.00 [✓ 10.00]	10.39	10.04	-174.2		

1.25 mil yellow membrane
Acceptable: 4.31 to 8.00 uA

DISSOLVED OXYGEN (% sat)	75.7	100	3.8

Comments or Notes

PH 4 slightly out of range but slope ok

Changed DO probe

-172.4

APPENDIX C

Constituent Concentrations

Nitrate as N

Lachat Method EPA 353.2 Nitrite +Nitrate (results in red)

Site Name	Sample ID	September 4-7, 2018 Baseflow			October 3, 2018			November 21-22, 2018			January 16-17, 2019			February 2, 2019			March 18-19, 2019 Baseflow		
		concentration (mg/L)	Flow (cfs)	Instantaneous Load (lbs)	concentration (mg/L)	Flow (cfs)	Instantaneous Load (lbs)	concentration (mg/L)	Flow (cfs)	Instantaneous Load (lbs)	concentration (mg/L)	Flow (cfs)	Instantaneous Load	concentration (mg/L)	Flow (cfs)	Instantaneous Load (lbs)	concentration (mg/L)	Flow (cfs)	Instantaneous Load (lbs)
Chalk Creek @ Chalk Bluff	CC@CB	1.40	0.61								0.71	13.7		0.57	13.7		1.60	1.29	
Alum Creek @ Truckee River	AC@TR		1.07								0.46	3.98		0.13	4.70		0.06	1.83	
North Truckee Drain @ Orr Ditch	NTD@ORD	1.50	3.69								0.90	37.90		0.70	15.10		1.40	1.83	
North Truckee Drain at Big Fish Drive	NTD@BFD (1)	1.30	2.94								0.60	20.00		2.30	3.77		1.90	4.16	
North Truckee Drain at Big Fish Drive	NTD@BFD(2)	1.30	2.88								0.50	19.30		0.88	10.70		1.90	3.93	
North Truckee Drain at Big Fish Drive	NTD@BFD(3)	1.50	3.17								0.29	238.00		0.50	57.20		2.00	3.70	
North Truckee Drain at Big Fish Drive	NTD@BFD(4)	1.20	2.71								0.77	201.00		0.44	50.90		2.10	3.70	
Thomas Creek @ S. Meadows Pkwy	TC@SMP		0.30		0.16	1.66					1.10	17.00						2.98	
Whites Creek @ Old Virginia Hwy	WC@OVH	0.04	1.75								0.49	9.53		0.07	6.66			5.82	
Steamboat Creek @ Rhodes Road	SBC@RHR	0.14	7.13								0.56	29.70		0.31	21.10		0.13	36.10	
Steamboat Creek @ Narrows	SBC@NAR	0.05	13.50								0.60	338.00		0.23	44.50		0.03	53.80	
Yori drain @ Steamboat Creek	YD@SBC(1)	0.05						1.50	3.18		1.60	5.35		1.80			2.10	4.52	
Yori drain @ Steamboat Creek	YD@SBC(2)	0.04						1.40	3.44		0.50	8.61		2.10			2.10	4.33	
Yori drain @ Steamboat Creek	YD@SBC(3)	0.05						1.40	3.53		0.66			1.40			2.20	4.04	
Yori drain @ Steamboat Creek	YD@SBC(4)	0.04						1.40	3.69		0.89	15.72		1.60			2.20	4.06	
Boynton Slough @ Steamboat Creek	BS@SBC (1)	0.38	21.50								1.00	80.87		1.70	10.16		1.00	26.05	
Boynton Slough @ Steamboat Creek	BS@SBC (2)	0.39	21.50											1.70	20.53		1.00	25.90	
Boynton Slough @ Steamboat Creek	BS@SBC (3)	0.41	21.50											1.10	62.23		0.92	25.19	
Boynton Slough @ Steamboat Creek	BS@SBC (4)	0.39	21.50											0.60	133.64		0.96	27.43	
Steamboat Creek @ Clean Water Way	SBC@CWW(1)	0.19	30.40								0.83	123.00		0.85	50.20		0.48	92.00	
Steamboat Creek @ Clean Water Way	SBC@CWW(2)	0.21	32.40								0.53	143.00		1.20	89.20		0.48	90.50	
Steamboat Creek @ Clean Water Way	SBC@CWW(3)	0.20	31.90								0.72	593.00		1.20	141.00		0.49	89.70	
Steamboat Creek @ Clean Water Way	SBC@CWW(4)	0.20	30.40								0.88	586.00		0.90	170.00		0.46	95.20	
Arlington (south)	H-19 (1)							1.70	0.11		0.24	3.346							
Arlington (south)	H-19 (2)							0.7	1.48		0.10	8.79							
Arlington (south)	H-19 (3)							0.75	1.45		0.12	12.47							
Arlington (south)	H-19 (4)							1.10	1.02										
Fisherman's Park II	D-16 (1)							4.70	1.014		0.37	3.39							
Fisherman's Park II	D-16 (2)							0.82	11.309		0.26	3.958							
Fisherman's Park II	D-16 (3)							0.61	15.75		0.17	43.194							
Fisherman's Park II	D-16 (4)							0.68	10.281		0.60	1.726							
Oxbow Nature Park	C-24 (1)							2.60	0.637		0.22	3.245							
Oxbow Nature Park	C-24 (2)							0.62	0.734		0.21	2.3							
Oxbow Nature Park	C-24 (3)							0.45	0.622		0.15	13.784							
Oxbow Nature Park	C-24 (4)							0.69	1.429		0.89	1.262							
Mary Wahl Ditch	SDOE-008936 (1)							2.30			0.30								
Mary Wahl Ditch	SDOE-008936 (2)																		
Mary Wahl Ditch	SDOE-008936 (3)																		
Mary Wahl Ditch	SDOE-008936 (4)							0.74	1.539										

Ortho P

Site Name	Sample ID	September 4-7, 2018 Baseflow			October 3, 2018			November 21-22, 2018			January 16-17, 2019			February 2, 2019			March 18-19, 2019 Baseflow		
		concentration (mg/L)	Flow (cfs)	Instantaneous Load (lbs)	concentration (mg/L)	Flow (cfs)	Instantaneous Load (lbs)	concentration (mg/L)	Flow (cfs)	Instantaneous Load (lbs)	concentration (mg/L)	Flow (cfs)	Instantaneous Load (lbs)	concentration (mg/L)	Flow (cfs)	Instantaneous Load (lbs)	concentration (mg/L)	Flow (cfs)	Instantaneous Load (lbs)
Chalk Creek @ Chalk Bluff	CC@CB	0.31	0.61								0.22	13.7		0.15	13.7		0.31	1.29	
Alum Creek @ Truckee River	AC@TR	0.07	1.07								0.04	4.0			4.7		0.02	1.8	
North Truckee Drain @ Orr Ditch	NTD@ORD	0.12	3.69								0.30	37.90		0.13	15.10		0.15	1.83	
North Truckee Drain at Big Fish Drive	NTD@BFD (1)	0.09	2.94								0.11	20.00		0.18	3.77		0.07	4.16	
North Truckee Drain at Big Fish Drive	NTD@BFD(2)	0.08	2.88								0.12	19.30		0.09	10.70		0.06	3.93	
North Truckee Drain at Big Fish Drive	NTD@BFD(3)	0.09	3.17								0.12	238.00		0.09	57.20		0.08	3.70	
North Truckee Drain at Big Fish Drive	NTD@BFD(4)	0.09	2.71								0.26	201.00		0.11	50.90		0.07	3.70	
Thomas Creek @ S. Meadows Pkwy	TC@SMP	0.07	0.30		0.05	1.66					0.38	17.00					0.04	2.98	
Whites Creek @ Old Virginia Hwy	WC@OVH	0.02	1.75								0.33	9.53		0.02	6.66			5.82	
Yori drain @ Steamboat Creek	YD@SBC(1)	0.02						0.09	3.18		0.13	5.35		0.11			0.09	4.52	
Yori drain @ Steamboat Creek	YD@SBC(2)	0.03						0.06	3.44		0.13	8.61		0.08			0.08	4.33	
Yori drain @ Steamboat Creek	YD@SBC(3)	0.03						0.03	3.53		0.24			0.08			0.09	4.04	
Yori drain @ Steamboat Creek	YD@SBC(4)	0.05						0.02	3.69		0.15	15.72		0.07			0.09	4.06	
Boynton Slough @ Steamboat Creek	BS@SBC (1)	0.08	21.50								0.10	80.87		0.09	10.16		0.07	26.05	
Boynton Slough @ Steamboat Creek	BS@SBC (2)	0.09	21.50											0.09	20.53		0.06	25.90	
Boynton Slough @ Steamboat Creek	BS@SBC (3)	0.09	21.50											0.08	62.23		0.08	25.19	
Boynton Slough @ Steamboat Creek	BS@SBC (4)	0.09	21.50											0.09	133.64		0.07	27.43	
Steamboat Creek @ Rhodes Road	SBC@RHR	0.26	7.13								0.20	29.70		0.08	21.10		0.17	36.10	
Steamboat Creek @ Narrows	SBC@NAR	0.26	13.50								0.37	338.00		0.19	44.50		0.15	53.80	
Steamboat Creek @ Clean Water Way	SBC@CWW(1)	0.15	30.40								0.11	123.00		0.12	50.20		0.10	92.00	
Steamboat Creek @ Clean Water Way	SBC@CWW(2)	0.14	32.40								0.14	143.00		0.10	89.20		0.11	90.50	
Steamboat Creek @ Clean Water Way	SBC@CWW(3)	0.20	31.90								0.31	593.00		0.09	141.00		0.12	89.70	
Steamboat Creek @ Clean Water Way	SBC@CWW(4)	0.19	30.40								0.31	586.00		0.10	170.00		0.12	95.20	
Arlington (south)	H-19 (1)							1.30	0.11		0.13	3.35							
Arlington (south)	H-19 (2)							0.48	1.48		0.14	8.79							
Arlington (south)	H-19 (3)							0.78	1.45		0.14	12.47							
Arlington (south)	H-19 (4)							1.00	1.02										
Fisherman's Park II	D-16 (1)							0.71	1.014		0.14	3.39							
Fisherman's Park II	D-16 (2)							0.37	11.309		0.17	3.958							
Fisherman's Park II	D-16 (3)							0.38	15.75		0.17	43.194							
Fisherman's Park II	D-16 (4)							0.36	10.281		0.30	1.726							
Oxbow Nature Park	C-24 (1)							0.94	0.637		0.12	3.245							
Oxbow Nature Park	C-24 (2)							0.54	0.734		0.11	2.3							
Oxbow Nature Park	C-24 (3)							0.31	0.622		0.11	13.784							
Oxbow Nature Park	C-24 (4)							0.23	1.429		0.23	1.262							
Mary Wahl Ditch	SDOE-008936 (1)							0.67			0.12								
Mary Wahl Ditch	SDOE-008936 (2)																		
Mary Wahl Ditch	SDOE-008936 (3)																		
Mary Wahl Ditch	SDOE-008936 (4)							0.50	1.539										

TKN																			
Site Name	Sample ID																		
		September 4-7, 2018 Baseflow			October 3, 2018			November 21-22, 2018			January 16-17, 2019			February 2, 2019			March 18-19, 2019 Baseflow		
		concentration (mg/L)	Flow (cfs)	Instantaneous Load (lbs)	concentration (mg/L)	Flow (cfs)	Instantaneous Load (lbs)	concentration (mg/L)	Flow (cfs)	Instantaneous Load (lbs)	concentration (mg/L)	Flow (cfs)	Instantaneous Load (lbs)	concentration (mg/L)	Flow (cfs)	Instantaneous Load (lbs)	concentration (mg/L)	Flow (cfs)	Instantaneous Load (lbs)
Chalk Creek @ Chalk Bluff	CC@CB		0.61								0.84	13.7		0.78	13.7		0.94	1.29	
Alum Creek @ Truckee River	AC@TR		1.1								0.56	4.0		0.73	4.7		0.26	1.8	
North Truckee Drain @ Orr Ditch	NTD@ORD	0.70	3.69								1.70	37.90		1.30	15.10		1.30	1.83	
North Truckee Drain at Big Fish Drive	NTD@BFD (1)	0.96	2.94								2.40	20.00		1.10	3.77		2.00	4.16	
North Truckee Drain at Big Fish Drive	NTD@BFD(2)	1.00	2.88								1.4	19.30		1.40	10.70		1.60	3.93	
North Truckee Drain at Big Fish Drive	NTD@BFD(3)	1.10	3.17								1.9	238.00		1.10	57.20		1.20	3.70	
North Truckee Drain at Big Fish Drive	NTD@BFD(4)	1.20	2.71								1.8	201.00		1.10	50.90		1.20	3.70	
Thomas Creek @ S. Meadows Pkwy	TC@SMP		0.30		0.60	1.66					1.10	17.00						2.98	
Whites Creek @ Old Virginia Hwy	WC@OVH		1.75								0.84	9.53		0.33	6.66			5.82	
Steamboat Creek @ Rhodes Road	SBC@RHR	1.30	7.13								1.20	29.70		0.82	21.10		0.62	36.10	
Steamboat Creek @ Narrows	SBC@NAR	0.76	13.50								2.20	338.00		1.20	44.50		0.76	53.80	
Yori drain @ Steamboat Creek	YD@SBC(1)	1.50						1.50	3.18		1.00	5.35		0.72			0.90	4.52	
Yori drain @ Steamboat Creek	YD@SBC(2)	1.30						1.10	3.44		3.3	8.61		0.70			0.63	4.33	
Yori drain @ Steamboat Creek	YD@SBC(3)	1.20						0.83	3.53		2.1			0.96			0.52	4.04	
Yori drain @ Steamboat Creek	YD@SBC(4)	1.40						0.74	3.69		0.92	15.72		0.64			0.56	4.06	
Boynton Slough @ Steamboat Creek	BS@SBC (1)	0.70	21.50								0.70	80.87		0.51	10.16		0.74	26.05	
Boynton Slough @ Steamboat Creek	BS@SBC (2)	0.50	21.50											0.49	20.53		0.55	25.90	
Boynton Slough @ Steamboat Creek	BS@SBC (3)	0.48	21.50											0.93	62.23		0.50	25.19	
Boynton Slough @ Steamboat Creek	BS@SBC (4)	0.53	21.50											0.79	133.64		0.52	27.43	
Steamboat Creek @ Clean Water Way	SBC@CWW(1)	0.98	30.40								0.92	123.00		0.74	50.20		0.86	92.00	
Steamboat Creek @ Clean Water Way	SBC@CWW(2)	0.86	32.40								1.60	143.00		0.89	89.20		0.68	90.50	
Steamboat Creek @ Clean Water Way	SBC@CWW(3)	0.89	31.90								2.80	593.00		0.84	141.00		0.67	89.70	
Steamboat Creek @ Clean Water Way	SBC@CWW(4)	0.83	30.40								1.90	586.00		0.71	170.00		0.62	95.20	
Arlington (south)	H-19 (1)							11.00	0.11		1.50	3.35							
Arlington (south)	H-19 (2)							4.4	1.48		2.10	8.79							
Arlington (south)	H-19 (3)							4.70	1.45		1.30	12.47							
Arlington (south)	H-19 (4)							6.20	1.02										
Fisherman's Park II	D-16 (1)							19.00	1.014		1.90	3.39							
Fisherman's Park II	D-16 (2)							6.40	11.309		1.60	3.958							
Fisherman's Park II	D-16 (3)							4.40	15.75		2.00	43.194							
Fisherman's Park II	D-16 (4)							3.50	10.281		1.20	1.726							
Oxbow Nature Park	C-24 (1)							21.00	0.637		1.20	3.245							
Oxbow Nature Park	C-24 (2)							3.40	0.734		1.20	2.3							
Oxbow Nature Park	C-24 (3)							2.20	0.622		1.20	13.784							
Oxbow Nature Park	C-24 (4)							3.60	1.429		1.10	1.262							
Mary Wahl Ditch	SDOE-008936 (1)							17.00			1.40								
Mary Wahl Ditch	SDOE-008936 (2)																		
Mary Wahl Ditch	SDOE-008936 (3)																		
Mary Wahl Ditch	SDOE-008936 (4)							3.70	1.539										

Total N																			
Site Name	Sample ID	September 4-7, 2018 Baseflow			October 3, 2018			November 21-22, 2018			January 16-17, 2019			February 2, 2019			March 18-19, 2019 Baseflow		
		concentration (mg/L)	Flow (cfs)	Instantaneous Load (lbs)	concentration (mg/L)	Flow (cfs)	Instantaneous Load (lbs)	concentration (mg/L)	Flow (cfs)	Instantaneous Load (lbs)	concentration (mg/L)	Flow (cfs)	Instantaneous Load (lbs)	concentration (mg/L)	Flow (cfs)	Instantaneous Load (lbs)	concentration (mg/L)	Flow (cfs)	Instantaneous Load (lbs)
Chalk Creek @ Chalk Bluff	CC@CB	1.70	0.61	5.593							1.60	13.7	118.228	1.30	13.7	96.060	2.50	1.29	17.394
Alum Creek @ Truckee River	AC@TR		1.1								1.00	4.0	21.483	0.76	4.7	19.245	0.32	1.8	3.150
North Truckee Drain @ Orr Ditch	NTD@ORD	2.20	3.69	43.785							2.60	37.90	531.487	1.90	15.10	154.743	2.70	1.83	26.650
North Truckee Drain at Big Fish Drive	NTD@BFD (1)	2.30	2.94	36.472							3.00	20.00	323.617	3.30	3.77	67.102	3.90	4.16	87.506
North Truckee Drain at Big Fish Drive	NTD@BFD(2)	2.30	2.88	35.727							1.9	19.30	197.784	2.20	10.70	126.966	3.50	3.93	74.189
North Truckee Drain at Big Fish Drive	NTD@BFD(3)	2.60	3.17	44.454							2.2	238.00	2824.096	1.60	57.20	493.623	3.20	3.70	63.860
North Truckee Drain at Big Fish Drive	NTD@BFD(4)	2.40	2.71	35.080							2.6	201.00	2818.702	1.50	50.90	411.802	3.30	3.70	65.856
Thomas Creek @ S. Meadows Pkwy	TC@SMP		0.30		0.76	1.66	6.804582179				2.20	17.00	201.721					2.98	
Whites Creek @ Old Virginia Hwy	WC@OVH	0.23	1.75	2.171							1.30	9.53	66.821	0.36	6.66	12.932		5.82	
Steamboat Creek @ Rhodes Road	SBC@RHR	1.40	7.13	53.839							1.80	29.70	288.343	1.1	21.10	125.186	0.75	36.10	146.032
Steamboat Creek @ Narrows	SBC@NAR	0.82	13.50	59.707							2.80	338.00	5104.515	1.40	44.50	336.022	0.80	53.80	232.141
Yori drain @ Steamboat Creek	YD@SBC(1)	1.60						3.00	3.18	51.374	2.70	5.35	77.902	2.30			3.00	4.52	73.072
Yori drain @ Steamboat Creek	YD@SBC(2)	1.40						2.50	3.44	46.358	3.8	8.61	176.552	2.70			2.80	4.33	65.434
Yori drain @ Steamboat Creek	YD@SBC(3)	1.30						2.20	3.53	41.851	2.8			2.30			2.70	4.04	58.764
Yori drain @ Steamboat Creek	YD@SBC(4)	1.40						2.10	3.69	41.761	1.8	15.72	152.628	2.00			2.70	4.06	59.085
Boynton Slough @ Steamboat Creek	BS@SBC (1)	1.10	21.50	127.559							1.70	80.87	741.512	2.10	10.16	115.055	1.80	26.05	252.865
Boynton Slough @ Steamboat Creek	BS@SBC (2)	0.89	21.50	103.207										2.00	20.53	221.514	1.50	25.90	209.515
Boynton Slough @ Steamboat Creek	BS@SBC (3)	0.90	21.50	104.366										2.10	62.23	704.856	1.40	25.19	190.217
Boynton Slough @ Steamboat Creek	BS@SBC (4)	0.92	21.50	106.686										1.30	133.64	937.064	1.50	27.43	221.958
Steamboat Creek @ Clean Water Way	SBC@CWW(1)	1.20	30.40	196.759							1.70	123.00	1127.804	1.50	50.20	406.139	1.30	92.00	645.076
Steamboat Creek @ Clean Water Way	SBC@CWW(2)	1.10	32.40	192.228							2.10	143.00	1619.702	2.00	89.20	962.221	1.20	90.50	585.746
Steamboat Creek @ Clean Water Way	SBC@CWW(3)	1.10	31.90	189.262							3.50	593.00	11194.444	2.00	141.00	1520.999	1.20	89.70	580.569
Steamboat Creek @ Clean Water Way	SBC@CWW(4)	1.00	30.40	163.966							2.80	586.00	8849.840	1.50	170.00	1375.371	1.10	95.20	564.819
Arlington (south)	H-19 (1)							12.00	0.11	7.120	1.70	3.35	30.680						
Arlington (south)	H-19 (2)							5.1	1.48	40.711	2.20	8.79	104.302						
Arlington (south)	H-19 (3)							5.50	1.45	43.014	1.40	12.47	94.162						
Arlington (south)	H-19 (4)							7.40	1.02	40.711									
Fisherman's Park II	D-16 (1)							24.00	1.014	131.259	2.30	3.39	42.054						
Fisherman's Park II	D-16 (2)							7.30	11.309	445.273	1.90	3.958	40.561						
Fisherman's Park II	D-16 (3)							5.00	15.75	424.747	2.20	43.194	512.538						
Fisherman's Park II	D-16 (4)							4.10	10.281	227.352	1.80	1.726	16.757						
Oxbow Nature Park	C-24 (1)							23.00	0.637	79.022	1.40	3.245	24.503						
Oxbow Nature Park	C-24 (2)							4.00	0.734	15.836	1.40	2.3	17.367						
Oxbow Nature Park	C-24 (3)							2.60	0.622	8.723	1.30	13.784	96.649						
Oxbow Nature Park	C-24 (4)							4.30	1.429	33.142	2.00	1.262	13.613						
Mary Wahl Ditch	SDOE-008936 (1)							19.00			1.70								
Mary Wahl Ditch	SDOE-008936 (2)																		
Mary Wahl Ditch	SDOE-008936 (3)																		
Mary Wahl Ditch	SDOE-008936 (4)							4.40	1.539	36.523									

Total P																			
Site Name	**Sample ID**																		
		September 4-7, 2018 Baseflow			**October 3, 2018**			**November 21-22, 2018**			**January 16-17, 2019**			**February 2, 2019**			**March 18-19, 2019 Baseflow**		
		concentration (mg/L)	**Flow (cfs)**	**Instantaneous Load (lbs)**	**concentration (mg/L)**	**Flow (cfs)**	**Instantaneous Load (lbs)**	**concentration (mg/L)**	**Flow (cfs)**	**Instantaneous Load (lbs)**	**concentration (mg/L)**	**Flow (cfs)**	**Instantaneous Load (lbs)**	**concentration (mg/L)**	**Flow (cfs)**	**Instantaneous Load (lbs)**	**concentration (mg/L)**	**Flow (cfs)**	**Instantaneous Load (lbs)**
Chalk Creek @ Chalk Bluff	CC@CB	0.36	0.61	1.184							0.37	13.7	27.340	0.40	13.7	29.557	0.32	1.29	2.226
Alum Creek @ Truckee River	AC@TR	0.09	1.1	0.525							0.09	4.0	1.933	0.34	4.7	8.610	0.03	1.8	0.335
North Truckee Drain @ Orr Ditch	NTD@ORD	0.15	3.69	2.985							0.19	37.90	38.839	0.17	15.10	13.845	0.29	1.83	2.862
North Truckee Drain at Big Fish Drive	NTD@BFD(1)	0.23	2.94	3.647							0.15	20.00	16.181	0.30	3.77	6.100	0.10	4.16	2.244
North Truckee Drain at Big Fish Drive	NTD@BFD(2)	0.24	2.88	3.728							0.12	19.30	12.492	0.13	10.70	7.503	0.23	3.93	4.875
North Truckee Drain at Big Fish Drive	NTD@BFD(3)	0.24	3.17	4.103							0.45	238.00	577.656	0.11	57.20	33.937	0.18	3.70	3.592
North Truckee Drain at Big Fish Drive	NTD@BFD(4)	0.21	2.71	3.070							0.23	201.00	249.347	0.22	50.90	60.398	0.16	3.70	3.193
Thomas Creek @ S. Meadows Pkwy	TC@SMP	0.09	0.30	0.150	0.14	1.66	1.253				0.36	17.00	33.009				0.05	2.98	0.723
Whites Creek @ Old Virginia Hwy	WC@OVH	0.05	1.75	0.453							0.22	9.53	11.308	0.13	6.66	4.670		5.82	
Steamboat Creek @ Rhodes Road	SBC@RHR	0.40	7.13	15.383							0.27	29.70	43.251	0.13	21.10	14.795	0.26	36.10	50.624
Steamboat Creek @ Narrows	SBC@NAR	0.35	13.50	25.485							0.41	338.00	747.447	0.23	44.50	55.204	0.28	53.80	81.249
Yori drain @ Steamboat Creek	YD@SBC(1)	0.19						0.26	3.18	4.452	0.23	5.35	6.636	0.18			0.12	4.52	2.923
Yori drain @ Steamboat Creek	YD@SBC(2)	0.18						0.19	3.44	3.523	0.36	8.61	16.726	0.11			0.09	4.33	2.080
Yori drain @ Steamboat Creek	YD@SBC(3)	0.17						0.07	3.53	1.256	0.26			0.11			0.08	4.04	1.763
Yori drain @ Steamboat Creek	YD@SBC(4)	0.25						0.07	3.69	1.312	0.15	15.72	12.719	0.33			0.08	4.06	1.816
Boynton Slough @ Steamboat Creek	BS@SBC (1)	0.14	21.50	16.235							0.17	80.87	74.151	0.16	10.16	8.766	0.14	26.05	19.667
Boynton Slough @ Steamboat Creek	BS@SBC (2)	0.13	21.50	15.075										0.17	20.53	18.829	0.10	25.90	13.968
Boynton Slough @ Steamboat Creek	BS@SBC (3)	0.13	21.50	15.075										0.12	62.23	40.277	0.12	25.19	16.304
Boynton Slough @ Steamboat Creek	BS@SBC (4)	0.13	21.50	15.075										0.11	133.64	79.290	0.11	27.43	16.277
Steamboat Creek @ Clean Water Way	SBC@CWW(1)	0.15	30.40	24.595							0.21	123.00	139.317	0.26	50.20	70.397	0.23	92.00	114.129
Steamboat Creek @ Clean Water Way	SBC@CWW(2)	0.14	32.40	24.465							0.2	143.00	154.257	0.15	89.20	72.167	0.19	90.50	92.743
Steamboat Creek @ Clean Water Way	SBC@CWW(3)	0.15	31.90	25.808							0.39	593.00	1247.381	0.21	141.00	159.705	0.21	89.70	101.599
Steamboat Creek @ Clean Water Way	SBC@CWW(4)	0.28	30.40	45.910							0.23	586.00	726.951	0.11	170.00	100.861	0.17	95.20	87.290
Arlington (south)	H-19 (1)							4.70	0.11		0.51	3.35							
Arlington (south)	H-19 (2)							1.4	1.48		0.23	8.79							
Arlington (south)	H-19 (3)							2.00	1.45		0.43	12.47							
Arlington (south)	H-19 (4)							2.30	1.02										
Fisherman's Park II	D-16 (1)							2.40	1.014		0.49	3.39							
Fisherman's Park II	D-16 (2)							2.40	11.309		0.49	3.958							
Fisherman's Park II	D-16 (3)							1.00	15.75		0.44	43.194							
Fisherman's Park II	D-16 (4)							0.82	10.281		0.25	1.726							
Oxbow Nature Park	C-24 (1)							1.50	0.637		0.26	3.245							
Oxbow Nature Park	C-24 (2)							0.84	0.734		0.2	2.3							
Oxbow Nature Park	C-24 (3)							0.47	0.622		0.11	13.784							
Oxbow Nature Park	C-24 (4)							0.98	1.429		0.29	1.262							
Mary Wahl Ditch	SDOE-008936 (1)							1.70			0.35								
Mary Wahl Ditch	SDOE-008936 (2)																		
Mary Wahl Ditch	SDOE-008936 (3)																		
Mary Wahl Ditch	SDOE-008936 (4)							1.00	1.539										

Total Dissolved Solids

Site Name	Sample ID	September 4-7, 2018 Baseflow			October 3, 2018			November 21-22, 2018			January 16-17, 2019			February 2, 2019			March 18-19, 2019 Baseflow		
		concentration (mg/L)	Flow (cfs)	Instantaneous Load (lbs)	concentration (mg/L)	Flow (cfs)	Instantaneous Load (lbs)	concentration (mg/L)	Flow (cfs)	Instantaneous Load (lbs)	concentration (mg/L)	Flow (cfs)	Instantaneous Load (lbs)	concentration (mg/L)	Flow (cfs)	Instantaneous Load (lbs)	concentration (mg/L)	Flow (cfs)	Instantaneous Load (lbs)
Chalk Creek @ Chalk Bluff	CC@CB	2300.00	0.61	7567.239							600.00	13.7	44335.499	1000.00	13.7	73892.498	2900.00	1.29	20177.506
Alum Creek @ Truckee River	AC@TR	230.00	1.1	1326.128							280.00	4.0	6015.173	410.00	4.7	10382.435	460.00	1.8	4527.938
North Truckee Drain @ Orr Ditch	NTD@ORD	590.00	3.69	11742.435							600.00	37.90	122650.760	260.00	15.10	21175.325	1100.00	1.83	10857.343
North Truckee Drain at Big Fish Drive	NTD@BFD(1)	550.00	2.94	8721.472							300.00	20.00	32361.678	730.00	3.77	14843.762	910.00	4.16	20418.061
North Truckee Drain at Big Fish Drive	NTD@BFD(2)	520.00	2.88	8077.475							200.00	19.30	20819.346	280.00	10.70	16159.265	950.00	3.93	20137.054
North Truckee Drain at Big Fish Drive	NTD@BFD(3)	580.00	3.17	9916.697							65.00	238.00	83439.193	160.00	57.20	49362.346	930.00	3.70	18559.422
North Truckee Drain at Big Fish Drive	NTD@BFD(4)	570.00	2.71	8331.514							290.00	201.00	314393.703	160.00	50.90	43925.584	900.00	3.70	17960.731
Thomas Creek @ S. Meadows Pkwy	TC@SMP	91.00	0.30	147.246	83.00	1.66	743.132				120.00	17.00	11002.971				89.00	2.98	1430.494
Whites Creek @ Old Virginia Hwy	WC@OVH	61.00	1.75	575.768							53.00	9.53	2724.260	68.00	6.66	2442.659	50.00	5.82	1569.541
Steamboat Creek @ Rhodes Road	SBC@RHR	290.00	7.13	11152.374							150.00	29.70	24028.546	180	21.10	20484.942	200.00	36.10	38941.886
Steamboat Creek @ Narrows	SBC@NAR	690.00	13.50	50241.505							260.00	338.00	473990.712	540.00	44.50	129608.521	360.00	53.80	104463.497
Yori drain @ Steamboat Creek	YD@SBC(1)	280.00						300.00	3.18	5137.416	230.00	5.35	6636.072	400.00			360.00	4.52	8768.678
Yori drain @ Steamboat Creek	YD@SBC(2)	270.00						290.00	3.44	5377.540	120.00	8.61	5575.312	380.00			400.00	4.33	9347.686
Yori drain @ Steamboat Creek	YD@SBC(3)	290.00						310.00	3.53	5897.215	220.00			260.00			380.00	4.04	8270.450
Yori drain @ Steamboat Creek	YD@SBC(4)	290.00						360.00	3.69	7159.050	260.00	15.72	22046.295	270.00			390.00	4.06	8534.545
Boynton Slough @ Steamboat Creek	BS@SBC (1)	130.00	21.50	15075.148							250.00	80.87	109045.837	400.00	10.16	21915.203	230.00	26.05	32310.572
Boynton Slough @ Steamboat Creek	BS@SBC (2)	200.00	21.50	23192.536										410.00	20.53	45410.420	250.00	25.90	34919.084
Boynton Slough @ Steamboat Creek	BS@SBC (3)	240.00	21.50	27831.043										260.00	62.23	87267.841	240.00	25.19	32608.575
Boynton Slough @ Steamboat Creek	BS@SBC (4)	200.00	21.50	23192.536										120.00	133.64	86498.257	250.00	27.43	36992.927
Steamboat Creek @ Clean Water Way	SBC@CWW(1)	390.00	30.40	63946.676							360.00	123.00	238829.184	450.00	50.20	121841.718	330.00	92.00	163750.091
Steamboat Creek @ Clean Water Way	SBC@CWW(2)	360.00	32.40	62911.102							280.00	143.00	215960.265	420.00	89.20	202066.318	310.00	90.50	151317.813
Steamboat Creek @ Clean Water Way	SBC@CWW(3)	400.00	31.90	68822.502							270.00	593.00	863571.380	360.00	141.00	273779.797	300.00	89.70	145142.126
Steamboat Creek @ Clean Water Way	SBC@CWW(4)	450.00	30.40	73784.626							240.00	586.00	758557.734	320.00	170.00	293412.548	340.00	95.20	174580.466
Arlington (south)	H-19 (1)							1000.00	0.11		480.00	3.35							
Arlington (south)	H-19 (2)							75	1.48		24.00	8.79							
Arlington (south)	H-19 (3)							220.00	1.45		18.00	12.47							
Arlington (south)	H-19 (4)							390.00	1.02										
Fisherman's Park II	D-16 (1)							870.00	1.014		470.00	3.39							
Fisherman's Park II	D-16 (2)							180.00	11.309		63.00	3.958							
Fisherman's Park II	D-16 (3)							110.00	15.75		26.00	43.194							
Fisherman's Park II	D-16 (4)							110.00	10.281		140.00	1.726							
Oxbow Nature Park	C-24 (1)							970.00	0.637		180.00	3.245							
Oxbow Nature Park	C-24 (2)							190.00	0.734			2.3							
Oxbow Nature Park	C-24 (3)							160.00	0.622		27.00	13.784							
Oxbow Nature Park	C-24 (4)							210.00	1.429		110.00	1.262							
Mary Wahl Ditch	SDOE-008936 (1)							640.00			130.00								
Mary Wahl Ditch	SDOE-008936 (2)																		
Mary Wahl Ditch	SDOE-008936 (3)																		
Mary Wahl Ditch	SDOE-008936 (4)							130.00	1.539										

		TSS																			
		Site Name	Sample ID																		
				September 4-7, 2018 Baseflow			October 3, 2018			November 21-22, 2018			January 16-17, 2019			February 2, 2019			March 18-19, 2019 Baseflow		
				concentration (mg/L)	Flow (cfs)	Instantaneous Load (lbs)	concentration (mg/L)	Flow (cfs)	Instantaneous Load (lbs)	concentration (mg/L)	Flow (cfs)	Instantaneous Load (lbs)	concentration (mg/L)	Flow (cfs)	Instantaneous Load (lbs)	concentration (mg/L)	Flow (cfs)	Instantaneous Load (lbs)	concentration (mg/L)	Flow (cfs)	Instantaneous Load (lbs)
1	1	Chalk Creek @ Chalk Bluff	CC@CB	4.00	0.61								73.00	13.7		99.00	13.7		5.00	1.29	
2	2	Alum Creek @ Truckee River	AC@TR	24.00	1.1								45.00	4.0		140.00	4.7		35.00	1.8	
1	3	North Truckee Drain @ Orr Ditch	NTD@ORD	8.00	3.69								100.00	37.90		130.00	15.10		30.00	1.83	
2	4	North Truckee Drain at Big Fish Drive	NTD@BFD(1)	61.00	2.94								47.00	20.00		27.00	3.77		120.00	4.16	
2	4	North Truckee Drain at Big Fish Drive	NTD@BFD(2)	75.00	2.88								120.00	19.30		140.00	10.70		53.00	3.93	
2	4	North Truckee Drain at Big Fish Drive	NTD@BFD(3)	69.00	3.17								230.00	238.00		140.00	57.20		38.00	3.70	
2	4	North Truckee Drain at Big Fish Drive	NTD@BFD(4)	58.00	2.71								240.00	201.00		160.00	50.90		26.00	3.70	
4	5	Thomas Creek @ S. Meadows Pkwy	TC@SMP	5.00	0.30		20.00	1.66					50.00	17.00					5.00	2.98	
1	6	Whites Creek @ Old Virginia Hwy	WC@OVH	6.00	1.75								33.00	9.53		44.00	6.66		2.00	5.82	
1	7	Steamboat Creek @ Rhodes Road	SBC@RHR	17.00	7.13								56.00	29.70		71.00	21.10		20.00	36.10	
2	8	Steamboat Creek @ Narrows	SBC@NAR	10.00	13.50								330.00	338.00		180.00	44.50		31.00	53.80	
5	9	Yori drain @ Steamboat Creek	YD@SBC(1)	44.00						65.00	3.18		50.00	5.35		29.00			31.00	4.52	
5	9	Yori drain @ Steamboat Creek	YD@SBC(2)	38.00						28.00	3.44		700.00	8.61		36.00			19.00	4.33	
5	9	Yori drain @ Steamboat Creek	YD@SBC(3)	37.00						24.00	3.53		410.00			87.00			19.00	4.04	
5	9	Yori drain @ Steamboat Creek	YD@SBC(4)	58.00						30.00	3.69		45.00	15.72		31.00			16.00	4.06	
6	10	Boynton Slough @ Steamboat Creek	BS@SBC (1)	13.00	21.50								26.00	80.87		29.00	10.16		66.00	26.05	
6	10	Boynton Slough @ Steamboat Creek	BS@SBC (2)	11.00	21.50											20.00	20.53		28.00	25.90	
6	10	Boynton Slough @ Steamboat Creek	BS@SBC (3)	15.00	21.50											86.00	62.23		32.00	25.19	
6	10	Boynton Slough @ Steamboat Creek	BS@SBC (4)	23.00	21.50											110.00	133.64		26.00	27.43	
3	11	Steamboat Creek @ Clean Water Way	SBC@CWW(1)	72.00	30.40								68.00	123.00		52.00	50.20		65.00	92.00	
3	11	Steamboat Creek @ Clean Water Way	SBC@CWW(2)	67.00	32.40								280.00	143.00		98.00	89.20		46.00	90.50	
3	11	Steamboat Creek @ Clean Water Way	SBC@CWW(3)	77.00	31.90								680.00	593.00		110.00	141.00		60.00	89.70	
3	11	Steamboat Creek @ Clean Water Way	SBC@CWW(4)	37.00	30.40								260.00	586.00		80.00	170.00		47.00	95.20	
1	12	Arlington (south)	H-19 (1)							550.00	0.11		120.00	3.35							
1	12	Arlington (south)	H-19 (2)							240	1.48		240.00	8.79							
1	12	Arlington (south)	H-19 (3)							250.00	1.45		150.00	12.47							
1	12	Arlington (south)	H-19 (4)							250.00	1.02										
2	13	Fisherman's Park II	D-16 (1)							230.00	1.014		180.00	3.39							
2	13	Fisherman's Park II	D-16 (2)							500.00	11.309		310.00	3.958							
2	13	Fisherman's Park II	D-16 (3)							310.00	15.75		430.00	43.194							
2	13	Fisherman's Park II	D-16 (4)							92.00	10.281		23.00	1.726							
3	14	Oxbow Nature Park	C-24 (1)							610.00	0.637		150.00	3.245							
3	14	Oxbow Nature Park	C-24 (2)							28.00	0.734		160.00	2.3							
3	14	Oxbow Nature Park	C-24 (3)							12.00	0.622		210.00	13.784							
3	14	Oxbow Nature Park	C-24 (4)							76.00	1.429		22.00	1.262							
3	15	Mary Wahl Ditch	SDOE-008936 (1)							420.00			110.00								
3	15	Mary Wahl Ditch	SDOE-008936 (2)																		
3	15	Mary Wahl Ditch	SDOE-008936 (3)																		
3	15	Mary Wahl Ditch	SDOE-008936 (4)							56.00	1.539										

E. coli

Site Name	Sample ID	Results (MPN/100 mL)																	
		September 4-7, 2018 Baseflow			October 3, 2018			November 21-22, 2018			January 16-17, 2019			February 2, 2019			March 18-19, 2019 Baseflow		
		concentration (mg/L)	Flow (cfs)	Instantaneous Load (lbs)	concentration (mg/L)	Flow (cfs)	Instantaneous Load (lbs)	concentration (mg/L)	Flow (cfs)	Instantaneous Load (lbs)	concentration (mg/L)	Flow (cfs)	Instantaneous Load (lbs)	concentration (mg/L)	Flow (cfs)	Instantaneous Load (lbs)	concentration (mg/L)	Flow (cfs)	Instantaneous Load (lbs)
Chalk Creek @ Chalk Bluff	CC@CB		0.61									13.7			13.7			1.29	
Alum Creek @ Truckee River	AC@TR	86.2	1.069								209.8	3.983			4.7		6.3	1.83	
North Truckee Drain @ Orr Ditch	NTD@ORD		3.69									37.9			15.1			1.83	
North Truckee Drain @ Kleppe Ln	NTD@KLP (1)		2.94									20			3.77			4.16	
North Truckee Drain @ Kleppe Ln	NTD@KLP (2)		2.88									19.3			10.7			3.93	
North Truckee Drain @ Kleppe Ln	NTD@KLP (3)		3.17									238			57.2			3.7	
North Truckee Drain @ Kleppe Ln	NTD@KLP (4)		2.71									201			50.9			3.7	
Thomas Creek @ S. Meadows Pkwy	TC@SMP		0.3			1.66						17						2.98	
Whites Creek @ Old Virginia Hwy	WC@OVH	435.2	2								816.4	9.53			666%		11	5.82	
Steamboat Creek @ Rhodes Road	SBC@RHR	980.4	7.13								686.7	29.7			21.1		15.6	36.1	
Steamboat Creek @ Narrows	SBC@NAR		13.5									338			44.5			53.8	
Steamboat Creek @ Clean Water Way	SBC@CWW(1)								3.175			5.35						4.52	
Steamboat Creek @ Clean Water Way	SBC@CWW(2)								3.438			8.61						4.33	
Steamboat Creek @ Clean Water Way	SBC@CWW(3)								3.527									4.04	
Steamboat Creek @ Clean Water Way	SBC@CWW(4)								3.687			15.72						4.06	
Arlington (south)	H-19 (1)		21.5								90.8	80.87			10.16			26.05	
Arlington (south)	H-19 (2)		21.5												20.53			25.90	
Arlington (south)	H-19 (3)		21.5												62.23			25.19	
Arlington (south)	H-19 (4)		21.5												133.64			27.43	
Fisherman's Park II	D-16 (1)		30.4								280.9	123			50.2			92	
Fisherman's Park II	D-16 (2)		32.4									143			89.2			90.5	
Fisherman's Park II	D-16 (3)		31.9									593			141			89.7	
Fisherman's Park II	D-16 (4)		30.4									586			170			95.2	
Oxbow Nature Park	C-24 (1)								0.11			3.346							
Oxbow Nature Park	C-24 (2)								1.48			8.79							
Oxbow Nature Park	C-24 (3)								1.45			12.47							
Oxbow Nature Park	C-24 (4)								1.02										
Mary Wahl Ditch	SDOE-008936 (1)								1.014		410.6	3.39							
Mary Wahl Ditch	SDOE-008936 (2)								11.309			3.958							
Mary Wahl Ditch	SDOE-008936 (3)								15.75			43.194							
Mary Wahl Ditch	SDOE-008936 (4)								10.281			1.726							

APPENDIX D

Laboratory Reports

WETLAB
WESTERN ENVIRONMENTAL
TESTING LABORATORY

www.WETLaboratory.com

Specializing in Soil, Hazardous Waste and Water Analysis

9/18/2018

Balance Hydrologics	OrderID: *18090034*

800 Baucroft Ave. Suite 101
Berkeley, CA 94710
Attn: Brian Hastings

Dear: Brian Hastings

This is to transmit the attached analytical report. The analytical data and information contained therein was generated using specified or selected methods contained in references, such as Standard Methods for the Examination of Water and Wastewater, online edition, Methods for Determination of Organic Compounds in Drinking Water, EPA-600/4-79-020, and Test Methods for Evaluation of Solid Waste, Physical/Chemical Methods (SW846) Third Edition.

The samples were received by WETLAB-Western Environmental Testing Laboratory in good condition on 9/4/2018. Additional comments are located on page 2 of this report.

If you should have any questions or comments regarding this report, please do not hesitate to call.

Sincerely,

Jennifer Delaney
QA Specialist

Western Environmental Testing Laboratory
Report Comments

Balance Hydrologics - 18090034

Specific Report Comments

None

Report Legend

B	--	Blank contamination; Analyte detected above the method reporting limit in an associated blank
D	--	Due to the sample matrix dilution was required in order to properly detect and report the analyte. The reporting limit has been adjusted accordingly.
HT	--	Sample analyzed beyond the accepted holding time
J	--	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit
M	--	The matrix spike/matrix spike duplicate (MS/MSD) values for the analysis of this parameter were outside acceptance criteria due to probable matrix interference. The reported result should be considered an estimate.
N	--	There was insufficient sample available to perform a spike and/or duplicate on this analytical batch.
NC	--	Not calculated due to matrix interference
QD	--	The sample duplicate or matrix spike duplicate analysis demonstrated sample imprecision. The reported result should be considered an estimate.
QL	--	The result for the laboratory control sample (LCS) was outside WETLAB acceptance criteria and reanalysis was not possible. The reported data should be considered an estimate.
S	--	Surrogate recovery was outside of laboratory acceptance limits due to matrix interference. The associated blank and LCS surrogate recovery was within acceptance limits
SC	--	Spike recovery not calculated. Sample concentration >4X the spike amount; therefore, the spike could not be adequately recovered
U	--	The analyte was analyzed for, but was not detected above the level of the reported sample reporting/quantitation limit

General Lab Comments

Per method recommendation (section 4.4), Samples analyzed by methods EPA 300.0 and EPA 300.1 have been filtered prior to analysis.

The following is an interpretation of the results from EPA method 9223B:
A result of zero (0) indicates absence for both coliform and Escherichia coli meaning the water meets the microbiological requirements of the U.S. EPA Safe Drinking Water Act (SDWA). A result of one (1) for either test indicates presence and the water does not meet the SDWA requirements. Waters with positive tests should be disinfected by a certified water treatment operator and retested.

Per federal regulation the holding time for the following parameters in aqueous/water samples is 15 minutes: Residual Chlorine, pH, Dissolved Oxygen, Sulfite.

Western Environmental Testing Laboratory
Analytical Report

Balance Hydrologics
800 Baucroft Ave. Suite 101
Berkeley, CA 94710
Attn: Brian Hastings
Phone: (510-704-1000 **Fax:**
PO\Project: *213136*

Date Printed: 9/18/2018
OrderID: *18090034*

Customer Sample ID: NTD @ ORD
WETLAB Sample ID: 18090034-001
Collect Date/Time: 9/4/2018 11:08
Receive Date: 9/4/2018 14:10

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.12	mg/L	1	0.010	9/4/2018	NV00925
Total Phosphorous as P	SM 4500-P E	0.15	mg/L	1	0.010	9/5/2018	NV00925
Total Suspended Solids (TSS)	SM 2540D	8	mg/L	1	1	9/5/2018	NV00925
Total Nitrogen	Calc.	2.2	mg/L	1	0.22	9/11/2018	NV00925
Total Dissolved Solids (TDS)	SM 2540C	590	mg/L	1	10	9/5/2018	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	1.5	mg/L	1	0.020	9/11/2018	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.70	mg/L	0.5	0.20	9/10/2018	NV00925

Customer Sample ID: SBC @ RHR
WETLAB Sample ID: 18090034-002
Collect Date/Time: 9/4/2018 12:02
Receive Date: 9/4/2018 14:10

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.26	mg/L	1	0.010	9/4/2018	NV00925
Total Phosphorous as P	SM 4500-P E	0.40	mg/L	1	0.010	9/7/2018	NV00925
Total Suspended Solids (TSS)	SM 2540D	17	mg/L	1	1.0	9/5/2018	NV00925
Total Nitrogen	Calc.	1.4	mg/L	1	0.22	9/11/2018	NV00925
Total Dissolved Solids (TDS)	SM 2540C	290	mg/L	1	10	9/5/2018	NV00925
Microbiological Analyses							
Total Coliform (MPN)	SM 9223B (Quantitray)	>2419.6	MPN/100ml	1	1.0	9/4/2018	NV00925
Escherichia Coli (MPN)	SM 9223B (Quantitray)	980.4	MPN/100ml	1	1.0	9/4/2018	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	0.14	mg/L	1	0.020	9/11/2018	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	1.3	mg/L	0.5	0.20	9/10/2018	NV00925

Customer Sample ID: WC @ OVH
WETLAB Sample ID: 18090034-003
Collect Date/Time: 9/4/2018 12:38
Receive Date: 9/4/2018 14:10

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.018	mg/L	1	0.010	9/4/2018	NV00925
Total Phosphorous as P	SM 4500-P E	0.048	mg/L	1	0.010	9/7/2018	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Customer Sample ID: WC @ OVH **Collect Date/Time:** 9/4/2018 12:38

WETLAB Sample ID: 18090034-003 **Receive Date:** 9/4/2018 14:10

Analyte	**Method**	**Results**	**Units**	**DF**	**RL**	**Analyzed**	**LabID**
Total Suspended Solids (TSS)	SM 2540D	6	mg/L	1	1	9/5/2018	NV00925
Total Nitrogen	Calc.	0.23	mg/L	1	0.22	9/11/2018	NV00925
Total Dissolved Solids (TDS)	SM 2540C	61	mg/L	1	10	9/5/2018	NV00925
Microbiological Analyses							
Total Coliform (MPN)	SM 9223B (Quantitray)	>2419.6	MPN/100ml	1	1.0	9/4/2018	NV00925
Escherichia Coli (MPN)	SM 9223B (Quantitray)	435.2	MPN/100ml	1	1.0	9/4/2018	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	0.043	mg/L	1	0.020	9/11/2018	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	ND	mg/L	0.5	0.20	9/10/2018	NV00925

Customer Sample ID: SBC @ NAR **Collect Date/Time:** 9/4/2018 13:19

WETLAB Sample ID: 18090034-004 **Receive Date:** 9/4/2018 14:10

Analyte	**Method**	**Results**	**Units**	**DF**	**RL**	**Analyzed**	**LabID**
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.26	mg/L	1	0.010	9/4/2018	NV00925
Total Phosphorous as P	SM 4500-P E	0.35	mg/L	1	0.010	9/10/2018	NV00925
Total Suspended Solids (TSS)	SM 2540D	10	mg/L	1	1.0	9/5/2018	NV00925
Total Nitrogen	Calc.	0.82	mg/L	1	0.22	9/11/2018	NV00925
Total Dissolved Solids (TDS)	SM 2540C	690	mg/L	1	10	9/5/2018	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	0.053	mg/L	1	0.020	9/11/2018	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.76	mg/L	0.5	0.20	9/10/2018	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Western Environmental Testing Laboratory
QC Report

QCBatchID	QCType	Parameter	Method	Result	Actual	% Rec	Units
QC18090058	Blank 1	Orthophosphate, as P	SM 4500-P E	ND			mg/L
QC18090114	Blank 1	Total Coliform (MPN)	SM 9223B (Qu	ND			MPN/100ml
		Escherichia Coli (MPN)	SM 9223B (Qu	ND			MPN/100ml
QC18090118	Blank 1	Total Phosphorous as P	SM 4500-P E	ND			mg/L
QC18090233	Blank 1	Total Dissolved Solids (TDS)	SM 2540C	ND			mg/L
QC18090241	Blank 1	Total Suspended Solids (TSS)	SM 2540D	ND			mg/L
QC18090247	Blank 1	Total Phosphorous as P	SM 4500-P E	ND			mg/L
QC18090296	Blank 1	Total Kjeldahl Nitrogen	EPA 351.2	ND			mg/L
QC18090306	Blank 1	Total Phosphorous as P	SM 4500-P E	ND			mg/L
QC18090381	Blank 1	Nitrate + Nitrite Nitrogen	EPA 353.2	ND			mg/L

QCBatchID	QCType	Parameter	Method	Result	Actual	% Rec	Units
QC18090058	LCS 1	Orthophosphate, as P	SM 4500-P E	0.253	0.250	101	mg/L
QC18090118	LCS 1	Total Phosphorous as P	SM 4500-P E	0.245	0.250	98	mg/L
QC18090233	LCS 1	Total Dissolved Solids (TDS)	SM 2540C	138	150	92	mg/L
QC18090233	LCS 2	Total Dissolved Solids (TDS)	SM 2540C	142	150	95	mg/L
QC18090241	LCS 1	Total Suspended Solids (TSS)	SM 2540D	197	200	98	mg/L
QC18090241	LCS 2	Total Suspended Solids (TSS)	SM 2540D	197	200	98	mg/L
QC18090247	LCS 1	Total Phosphorous as P	SM 4500-P E	0.274	0.250	110	mg/L
QC18090296	LCS 1	Total Kjeldahl Nitrogen	EPA 351.2	0.965	1.00	96	mg/L
QC18090306	LCS 1	Total Phosphorous as P	SM 4500-P E	0.275	0.250	110	mg/L
QC18090381	LCS 1	Nitrate + Nitrite Nitrogen	EPA 353.2	0.829	0.800	104	mg/L

QCBatchID	QCType	Parameter	Method	Duplicate Sample	Sample Result	Duplicate Result	Units	RPD
QC18090114	Duplicate 1	Total Coliform (MPN)	SM 9223B (Quanti	18090039-00	14.8	17.3	MPN/100ml	16 %
		Escherichia Coli (MPN)	SM 9223B (Quanti	18090039-00	ND	ND	MPN/100ml	<1%
QC18090114	Duplicate 2	Total Coliform (MPN)	SM 9223B (Quanti	18090039-00	ND	ND	MPN/100ml	<1%
		Escherichia Coli (MPN)	SM 9223B (Quanti	18090039-00	ND	ND	MPN/100ml	<1%
QC18090233	Duplicate 1	Total Dissolved Solids (TDS)	SM 2540C	18081048-00	263	260	mg/L	1 %
QC18090233	Duplicate 2	Total Dissolved Solids (TDS)	SM 2540C	18090034-00	589	565	mg/L	4 %
QC18090241	Duplicate 1	Total Suspended Solids (TSS)	SM 2540D	18090034-00	6.00	6.00	mg/L	<1%
QC18090241	Duplicate 2	Total Suspended Solids (TSS)	SM 2540D	18090034-00	10.5	9.50	mg/L	10 %

QCBatchID	QCType	Parameter	Method	Spike Sample	Sample Result		MS Result	MSD Result	Spike Value	Units	MS %Rec	MSD %Rec	RPD %
QC18090058	MS 1	Orthophosphate, as P	SM 4500-P E	18090034-00	0.117		0.362	0.363	0.25	mg/L	98	99	<1
QC18090118	MS 1	Total Phosphorous as P	SM 4500-P E	18090024-00	0.023		0.266	0.274	0.25	mg/L	97	101	3
QC18090118	MS 2	Total Phosphorous as P	SM 4500-P E	18090025-00	0.035		0.296	0.302	0.25	mg/L	104	107	2
QC18090247	MS 1	Total Phosphorous as P	SM 4500-P E	18090001-00	0.030		0.290	0.300	0.25	mg/L	104	108	3
QC18090247	MS 2	Total Phosphorous as P	SM 4500-P E	18090001-00	0.167		0.450	0.459	0.25	mg/L	113	117	2
QC18090296	MS 1	Total Kjeldahl Nitrogen	EPA 351.2	18081024-00	0.675	M	1.90	1.12	0.5	mg/L	NC	NC	NC
QC18090296	MS 2	Total Kjeldahl Nitrogen	EPA 351.2	18090153-00	ND		0.455	0.480	0.5	mg/L	91	96	5
QC18090306	MS 1	Total Phosphorous as P	SM 4500-P E	18090034-00	0.352		0.630	0.652	0.25	mg/L	111	120	3
QC18090306	MS 2	Total Phosphorous as P	SM 4500-P E	18090141-00	8.44	SC	12.4	12.1	0.25	mg/L	NC	NC	NC
QC18090381	MS 1	Nitrate + Nitrite Nitrogen	EPA 353.2	18081074-00	0.482	M	6.23	6.04	1	mg/L	NC	NC	NC
QC18090381	MS 2	Nitrate + Nitrite Nitrogen	EPA 353.2	18090001-00	0.058	M	1.19	1.20	1	mg/L	NC	NC	NC

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

WETLAB
WESTERN ENVIRONMENTAL TESTING LABORATORY
Specializing in Soil, Hazardous Waste and Water Analysis.
475 E. Greg Street #119 | Sparks, Nevada 89431 | www.WETLaboratory.com
tel (775) 355-0202 | fax (775) 355-0817
1084 Lamoille Highway | Elko, Nevada 89801
tel (775) 777-9933 | fax (775) 777-9933
3230 Polaris Ave., Suite 4 | Las Vegas, Nevada 89102
tel (702) 475-8899 | fax (702) 776-6152

WETLAB Order ID. 18090034
Sparks Control # ____
Elko Control # ____
LV Control # ____
Report Due Date ____
Page ____ of ____

Client Balance Hydrologics
Address 12020 Donner Pass Rd Suite B1
City, State & Zip Truckee CA 96161
Contact Brian Hastings
Phone 530.550.9776
Collector's Name BT
Fax
PWS/Project Name
P.O. Number
PWS/Project Number 213136
Email bhastings@balancehydro.com

Turnaround Time Requirements
Standard ____
5 Day* (25%) ____ 72 Hour* (50%) ____
48 Hour* (100%) ____ 24 Hour* (200%) ____
*Surcharges Will Apply

Samples Collected From Which State?
NV ____ CA ____
Other ____

Compliance Monitoring?
Yes No

Report to Regulatory Agency?
Yes No

Report Results Via
PDF EDD
Other ____

Standard QC Required?
Yes No

Billing Address (if different than Client Address)
Company Balance Hydrologics
Address 800 Bancroft Way Suite 101
City, State & Zip Berkeley CA 94710
Contact Rachel Boitano
Phone 510-704-1000 Fax ____
Email rboitano@balancehydro.com

SAMPLE ID/LOCATION	DATE	TIME	PRES TYPE *	SAMPLE TYPE **	NO. OF CONTAINERS	Total N	Total P	Ortho P	TSS	TDS	E coli					Spl. No.
NTD @ ORD	9/4/18	11:08		Aq	2	X	X	X	X	X						
SBC @ RHR		12:02			3	X	X	X	X	X	X					
WC @ OVH		12:38			3	X	X	X	X	X	X					
SBC @ NAR		13:19			2	X	X	X	X	X						

1809 2
0034 4

Instructions/Comments/Special Requirements:

Sample Matrix Key** **DW** = Drinking Water **WW** = Wastewater **SW** = Surface Water **MW** = Monitoring Well **SD** = Solid/Sludge **SO** = Soil **HW** = Hazardous Waste **OTHER:** ____

***SAMPLE PRESERVATIVES:** 1=Unpreserved 2=H2SO4 3=NaOH 4=HCl 5=HNO3 6=Na2S2O3 7=ZnOAc+NaOH 8=HCl/VOA Vial

Temp	Custody Seal	# of Containers	DATE	TIME	Samples Relinquished By	Samples Received By
8.9 °C	Y N [✓ None]	10	9/4/18	1410		
°C	Y N None					
°C	Y N None					
°C	Y N None					

WETLAB'S Standard Terms and Conditions apply unless written agreements specify otherwise. Payment terms are Net 30.

Client/Collector attests to the validity and authenticity of this (these) sample(s) and, is (are) aware that tampering with or intentionally mislabeling the sample(s) location, date or time of collection may be considered fraud and subject to legal action (NAC445.0636). ________ initial

To the maximum extent permitted by law, the Client agrees to limit the liability of WETLAB for the Client's damages to the total compensation received, unless other agreements are made in writing. This limitation shall apply regardless of the cause of action or legal theory pled or asserted. ________ initial

WETLAB will dispose of samples 90 days from sample receipt. Client may request a longer sample storage time for an additional fee. Please contact your Project Manager for details. ________ initial

WETLAB
WESTERN ENVIRONMENTAL TESTING LABORATORY
www.WETLaboratory.com
Specializing in Soil, Hazardous Waste and Water Analysis

9/21/2018

Balance Hydrologics
800 Baucroft Ave. Suite 101
Berkeley, CA 94710
Attn: Brian Hastings

OrderID: *18090109*

Dear: Brian Hastings

This is to transmit the attached analytical report. The analytical data and information contained therein was generated using specified or selected methods contained in references, such as Standard Methods for the Examination of Water and Wastewater, online edition, Methods for Determination of Organic Compounds in Drinking Water, EPA-600/4-79-020, and Test Methods for Evaluation of Solid Waste, Physical/Chemical Methods (SW846) Third Edition.

The samples were received by WETLAB-Western Environmental Testing Laboratory in good condition on 9/5/2018. Additional comments are located on page 2 of this report.

If you should have any questions or comments regarding this report, please do not hesitate to call.

Sincerely,

Jennifer Delaney
QA Specialist

Western Environmental Testing Laboratory
Report Comments

Balance Hydrologics - 18090109

Specific Report Comments

Due to a laboratory reanalysis requirement the analysis for Total Dissolved Solids on samples 18090109-001 through 003 was performed past the EPA recommended holding time. We apologize for any inconvenience this may have caused.

Report Legend

B -- Blank contamination; Analyte detected above the method reporting limit in an associated blank

D -- Due to the sample matrix dilution was required in order to properly detect and report the analyte. The reporting limit has been adjusted accordingly.

HT -- Sample analyzed beyond the accepted holding time

J -- The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit

M -- The matrix spike/matrix spike duplicate (MS/MSD) values for the analysis of this parameter were outside acceptance criteria due to probable matrix interference. The reported result should be considered an estimate.

N -- There was insufficient sample available to perform a spike and/or duplicate on this analytical batch.

NC -- Not calculated due to matrix interference

QD -- The sample duplicate or matrix spike duplicate analysis demonstrated sample imprecision. The reported result should be considered an estimate.

QL -- The result for the laboratory control sample (LCS) was outside WETLAB acceptance criteria and reanalysis was not possible. The reported data should be considered an estimate.

S -- Surrogate recovery was outside of laboratory acceptance limits due to matrix interference. The associated blank and LCS surrogate recovery was within acceptance limits

SC -- Spike recovery not calculated. Sample concentration >4X the spike amount; therefore, the spike could not be adequately recovered

U -- The analyte was analyzed for, but was not detected above the level of the reported sample reporting/quantitation limit

General Lab Comments

Per method recommendation (section 4.4), Samples analyzed by methods EPA 300.0 and EPA 300.1 have been filtered prior to analysis.

The following is an interpretation of the results from EPA method 9223B:
A result of zero (0) indicates absence for both coliform and Escherichia coli meaning the water meets the microbiological requirements of the U.S. EPA Safe Drinking Water Act (SDWA). A result of one (1) for either test indicates presence and the water does not meet the SDWA requirements. Waters with positive tests should be disinfected by a certified water treatment operator and retested.

Per federal regulation the holding time for the following parameters in aqueous/water samples is 15 minutes: Residual Chlorine, pH, Dissolved Oxygen, Sulfite.

Western Environmental Testing Laboratory
Analytical Report

Balance Hydrologics
800 Baucroft Ave. Suite 101
Berkeley, CA 94710
Attn: Brian Hastings
Phone: (510-704-1000 **Fax:**
PO\Project: *213136*

Date Printed: 9/21/2018
OrderID: *18090109*

Customer Sample ID: AC@TR
WETLAB Sample ID: 18090109-001

Collect Date/Time: 9/5/2018 09:15
Receive Date: 9/5/2018 13:40

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Orthophosphate, as P	SM 4500-P E	0.068		mg/L	1	0.010	9/5/2018	NV00925
Total Phosphorous as P	SM 4500-P E	0.091		mg/L	1	0.010	9/10/2018	NV00925
Total Suspended Solids (TSS)	SM 2540D	24		mg/L	1	1.0	9/5/2018	NV00925
Total Nitrogen	Calc.	ND		mg/L	1	0.50	9/12/2018	NV00925
Total Dissolved Solids (TDS)	SM 2540C	230	HT	mg/L	1	10	9/15/2018	NV00925
Microbiological Analyses								
Total Coliform (MPN)	SM 9223B (Quantitray)	>2419.6		MPN/100ml	1	1.0	9/5/2018	NV00925
Escherichia Coli (MPN)	SM 9223B (Quantitray)	86.2		MPN/100ml	1	1.0	9/5/2018	NV00925
Anions by Ion Chromatography								
Nitrate Nitrogen	EPA 300.0	ND		mg/L	1	0.10	9/5/2018	NV00925
Flow Injection Analyses								
Nitrate + Nitrite Nitrogen	EPA 353.2	ND		mg/L	5	0.10	9/11/2018	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	ND	M	mg/L	1	0.40	9/12/2018	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Customer Sample ID: CC@CB
WETLAB Sample ID: 18090109-002

Collect Date/Time: 9/5/2018 10:20
Receive Date: 9/5/2018 13:40

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Orthophosphate, as P	SM 4500-P E	0.31		mg/L	1	0.010	9/5/2018	NV00925
Total Phosphorous as P	SM 4500-P E	0.36		mg/L	1	0.010	9/21/2018	NV00925
Total Suspended Solids (TSS)	SM 2540D	4		mg/L	1	1	9/5/2018	NV00925
Total Nitrogen	Calc.	1.7		mg/L	1	0.50	9/12/2018	NV00925
Total Dissolved Solids (TDS)	SM 2540C	2300	HT	mg/L	1	10	9/15/2018	NV00925
Anions by Ion Chromatography								
Nitrate Nitrogen	EPA 300.0	1.2		mg/L	10	1.0	9/5/2018	NV00925
Flow Injection Analyses								
Nitrate + Nitrite Nitrogen	EPA 353.2	1.4		mg/L	5	0.10	9/11/2018	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	ND		mg/L	1	0.40	9/12/2018	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Customer Sample ID: TC@SMP
WETLAB Sample ID: 18090109-003

Collect Date/Time: 9/5/2018 11:20
Receive Date: 9/5/2018 13:40

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Orthophosphate, as P	SM 4500-P E	0.073		mg/L	1	0.010	9/5/2018	NV00925
Total Phosphorous as P	SM 4500-P E	0.093		mg/L	1	0.010	9/10/2018	NV00925
Total Suspended Solids (TSS)	SM 2540D	5		mg/L	1	1	9/5/2018	NV00925
Total Nitrogen	Calc.	ND		mg/L	1	0.50	9/12/2018	NV00925
Total Dissolved Solids (TDS)	SM 2540C	91	HT	mg/L	1	10	9/15/2018	NV00925
Flow Injection Analyses								
Nitrate + Nitrite Nitrogen	EPA 353.2	ND		mg/L	5	0.10	9/11/2018	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	ND		mg/L	1	0.40	9/12/2018	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Western Environmental Testing Laboratory
QC Report

QCBatchID	QCType	Parameter	Method	Result	Actual	% Rec	Units
QC18090142	Blank 1	Orthophosphate, as P	SM 4500-P E	ND			mg/L
QC18090152	Blank 1	Nitrate Nitrogen	EPA 300.0	ND			mg/L
QC18090203	Blank 1	Total Coliform (MPN)	SM 9223B (Qu	ND			MPN/100ml
		Escherichia Coli (MPN)	SM 9223B (Qu	ND			MPN/100ml
QC18090241	Blank 1	Total Suspended Solids (TSS)	SM 2540D	ND			mg/L
QC18090306	Blank 1	Total Phosphorous as P	SM 4500-P E	ND			mg/L
QC18090382	Blank 1	Nitrate + Nitrite Nitrogen	EPA 353.2	ND			mg/L
QC18090428	Blank 1	Total Kjeldahl Nitrogen	EPA 351.2	ND			mg/L
QC18090429	Blank 1	Total Kjeldahl Nitrogen	EPA 351.2	ND			mg/L
QC18090559	Blank 1	Total Dissolved Solids (TDS)	SM 2540C	ND			mg/L

QCBatchID	QCType	Parameter	Method	Result	Actual	% Rec	Units
QC18090142	LCS 1	Orthophosphate, as P	SM 4500-P E	0.250	0.250	100	mg/L
QC18090152	LCS 1	Nitrate Nitrogen	EPA 300.0	2.05	2.00	103	mg/L
QC18090241	LCS 1	Total Suspended Solids (TSS)	SM 2540D	197	200	98	mg/L
QC18090241	LCS 2	Total Suspended Solids (TSS)	SM 2540D	197	200	98	mg/L
QC18090306	LCS 1	Total Phosphorous as P	SM 4500-P E	0.275	0.250	110	mg/L
QC18090382	LCS 1	Nitrate + Nitrite Nitrogen	EPA 353.2	0.856	0.800	107	mg/L
QC18090428	LCS 1	Total Kjeldahl Nitrogen	EPA 351.2	0.972	1.00	97	mg/L
QC18090429	LCS 1	Total Kjeldahl Nitrogen	EPA 351.2	0.993	1.00	99	mg/L
QC18090559	LCS 1	Total Dissolved Solids (TDS)	SM 2540C	142	150	95	mg/L
QC18090559	LCS 2	Total Dissolved Solids (TDS)	SM 2540C	139	150	93	mg/L

QCBatchID	QCType	Parameter	Method	Duplicate Sample	Sample Result	Duplicate Result		Units	RPD
QC18090241	Duplicate 1	Total Suspended Solids (TSS)	SM 2540D	18090034-00	6.00	6.00		mg/L	<1%
QC18090241	Duplicate 2	Total Suspended Solids (TSS)	SM 2540D	18090034-00	10.5	9.50		mg/L	10 %
QC18090559	Duplicate 1	Total Dissolved Solids (TDS)	SM 2540C	18090102-00	561	576	HT	mg/L	3 %
QC18090559	Duplicate 2	Total Dissolved Solids (TDS)	SM 2540C	18090137-00	591	552	HT,Q	mg/L	7 %

QCBatchID	QCType	Parameter	Method	Spike Sample	Sample Result		MS Result	MSD Result	Spike Value	Units	MS %Rec	MSD %Rec	RPD %
QC18090142	MS 1	Orthophosphate, as P	SM 4500-P E	18090109-00	0.068		0.328	0.330	0.25	mg/L	104	105	<1
QC18090152	MS 1	Nitrate Nitrogen	EPA 300.0	18090080-00	ND		2.21	2.23	2	mg/L	110	110	<1
QC18090152	MS 2	Nitrate Nitrogen	EPA 300.0	18090102-00	2.08		4.24	4.27	2	mg/L	108	109	<1
QC18090306	MS 1	Total Phosphorous as P	SM 4500-P E	18090034-00	0.352		0.630	0.652	0.25	mg/L	111	120	3
QC18090306	MS 2	Total Phosphorous as P	SM 4500-P E	18090141-00	8.44	SC	12.4	12.1	0.25	mg/L	NC	NC	NC
QC18090382	MS 1	Nitrate + Nitrite Nitrogen	EPA 353.2	18090078-00	0.834	M	6.50	6.37	1	mg/L	NC	NC	NC
QC18090382	MS 2	Nitrate + Nitrite Nitrogen	EPA 353.2	18090102-00	2.27	M	7.89	7.90	1	mg/L	NC	NC	NC
QC18090428	MS 1	Total Kjeldahl Nitrogen	EPA 351.2	18090109-00	ND	M	1.29	1.13	1	mg/L	NC	NC	NC
QC18090428	MS 2	Total Kjeldahl Nitrogen	EPA 351.2	18090144-00	2.16	M	2.92	2.86	1	mg/L	NC	NC	NC
QC18090429	MS 1	Total Kjeldahl Nitrogen	EPA 351.2	18090142-00	ND		1.18	1.17	1	mg/L	96	95	<1
QC18090429	MS 2	Total Kjeldahl Nitrogen	EPA 351.2	18090142-00	ND	M	0.887	0.891	1	mg/L	NC	NC	NC

WETLAB

WESTERN ENVIRONMENTAL TESTING LABORATORY

Specializing in Soil, Hazardous Waste and Water Analysis.

475 E. Greg Street #119 | Sparks, Nevada 89431 | www.WETLaboratory.com
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tel (775) 777-9933 | fax (775) 777-9933
3230 Polaris Ave., Suite 4 | Las Vegas, Nevada 89102
tel (702) 475-8899 | fax (702) 776-6152

WETLAB Order ID. 18090109
Sparks Control # ____
Elko Control # ____
LV Control # ____
Report Due Date
Page 1 of 1

Client Balance Hydrologics
Address 12020 Donner Pass Rd Suite B1
City, State & Zip Truckee CA 96161
Contact Brian Hastings
Phone 530-550-9776
Collector's Name BT
Fax
PWS/Project Name
P.O. Number
PWS/Project Number 213136
Email bHastings@balancehydro.com

Turnaround Time Requirements
Standard ____
5 Day* (25%) ____ 72 Hour* (50%) ____
48 Hour* (100%) ____ 24 Hour* (200%) ____
*Surcharges Will Apply

Samples Collected From Which State?
NV____ CA____
Other____

Compliance Monitoring?
Yes No

Report to Regulatory Agency?
Yes No

Report Results Via
PDF EDD
Other ____

Standard QC Required?
Yes No

Billing Address (if different than Client Address)
Company Balance Hydrologics.
Address 800 Bancroft Way Suite 101
City, State & Zip Berkeley CA 94710
Contact Rachel Boitano
Phone 5107041000 Fax
Email rboitano@balancehydro.com

SAMPLE ID/LOCATION	DATE	TIME	PRES TYPE *	SAMPLE TYPE **	NO. OF CONTAINERS	Total N	Total P	Ortho P	TSS	TDS	Ecoli	NO3				Spl. No.
AC@TR	9/5/18	9:15		Aq	3	X	X	X	X	X	X	X				1
CC@CB	9/5/18	10:20		Aq	2	X	X	X	X	X		X				2
TC@SMP	9/5/18	11:20		Aq	2	X	X	X	X	X						3

Instructions/Comments/Special Requirements:

Sample Matrix Key** **DW** = Drinking Water **WW** = Wastewater **SW** = Surface Water **MW** = Monitoring Well **SD** = Solid/Sludge **SO** = Soil **HW** = Hazardous Waste **OTHER:**____

***SAMPLE PRESERVATIVES:** 1=Unpreserved 2=H2SO4 3=NaOH 4=HCl 5=HNO3 6=Na2S2O3 7=ZnOAc+NaOH 8=HCl/VOA Vial

Temp	Custody Seal	# of Containers	DATE	TIME	Samples Relinquished By	Samples Received By
16.6 °C	Y N [✓ None]	7	9-5-18	13:40		
°C	Y N None					
°C	Y N None					
°C	Y N None					

WETLAB'S Standard Terms and Conditions apply unless written agreements specify otherwise. Payment terms are Net 30.

Client/Collector attests to the validity and authenticity of this (these) sample(s) and, is (are) aware that tampering with or intentionally mislabeling the sample(s) location, date or time of collection may be considered fraud and subject to legal action (NAC445.0636). ____ initial

To the maximum extent permitted by law, the Client agrees to limit the liability of WETLAB for the Client's damages to the total compensation received, unless other agreements are made in writing. This limitation shall apply regardless of the cause of action or legal theory pled or asserted. ____ initial

WETLAB will dispose of samples 90 days from sample receipt. Client may request a longer sample storage time for an additional fee. Please contact your Project Manager for details. ____ initial

301.2E

WETLAB
WESTERN ENVIRONMENTAL
TESTING LABORATORY

www.WETLaboratory.com

Specializing in Soil, Hazardous Waste and Water Analysis

9/19/2018

Balance Hydrologics
800 Baucroft Ave. Suite 101
Berkeley, CA 94710
Attn: Brian Hastings

OrderID: *18090154*

Dear: Brian Hastings

This is to transmit the attached analytical report. The analytical data and information contained therein was generated using specified or selected methods contained in references, such as Standard Methods for the Examination of Water and Wastewater, online edition, Methods for Determination of Organic Compounds in Drinking Water, EPA-600/4-79-020, and Test Methods for Evaluation of Solid Waste, Physical/Chemical Methods (SW846) Third Edition.

The samples were received by WETLAB-Western Environmental Testing Laboratory in good condition on 9/5/2018. Additional comments are located on page 2 of this report.

If you should have any questions or comments regarding this report, please do not hesitate to call.

Sincerely,

Andy Smith
QA Manager

Western Environmental Testing Laboratory
Report Comments

Balance Hydrologics - 18090154

Specific Report Comments

None

Report Legend

B -- Blank contamination; Analyte detected above the method reporting limit in an associated blank

D -- Due to the sample matrix dilution was required in order to properly detect and report the analyte. The reporting limit has been adjusted accordingly.

HT -- Sample analyzed beyond the accepted holding time

J -- The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit

M -- The matrix spike/matrix spike duplicate (MS/MSD) values for the analysis of this parameter were outside acceptance criteria due to probable matrix interference. The reported result should be considered an estimate.

N -- There was insufficient sample available to perform a spike and/or duplicate on this analytical batch.

NC -- Not calculated due to matrix interference

QD -- The sample duplicate or matrix spike duplicate analysis demonstrated sample imprecision. The reported result should be considered an estimate.

QL -- The result for the laboratory control sample (LCS) was outside WETLAB acceptance criteria and reanalysis was not possible. The reported data should be considered an estimate.

S -- Surrogate recovery was outside of laboratory acceptance limits due to matrix interference. The associated blank and LCS surrogate recovery was within acceptance limits

SC -- Spike recovery not calculated. Sample concentration >4X the spike amount; therefore, the spike could not be adequately recovered

U -- The analyte was analyzed for, but was not detected above the level of the reported sample reporting/quantitation limit

General Lab Comments

Per method recommendation (section 4.4), Samples analyzed by methods EPA 300.0 and EPA 300.1 have been filtered prior to analysis.

The following is an interpretation of the results from EPA method 9223B:
A result of zero (0) indicates absence for both coliform and Escherichia coli meaning the water meets the microbiological requirements of the U.S. EPA Safe Drinking Water Act (SDWA). A result of one (1) for either test indicates presence and the water does not meet the SDWA requirements. Waters with positive tests should be disinfected by a certified water treatment operator and retested.

Per federal regulation the holding time for the following parameters in aqueous/water samples is 15 minutes: Residual Chlorine, pH, Dissolved Oxygen, Sulfite.

Western Environmental Testing Laboratory
Analytical Report

Balance Hydrologics
800 Baucroft Ave. Suite 101
Berkeley, CA 94710
Attn: Brian Hastings
Phone: (510-704-1000 **Fax:**
PO\Project: *213136*

Date Printed: 9/19/2018
OrderID: *18090154*

Customer Sample ID: NTD @ BFD (1) **Collect Date/Time:** 9/4/2018 12:00
WETLAB Sample ID: 18090154-001 **Receive Date:** 9/5/2018 16:30

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Orthophosphate, as P	SM 4500-P E	0.087		mg/L	1	0.010	9/5/2018	NV00925
Total Phosphorous as P	SM 4500-P E	0.23		mg/L	1	0.010	9/10/2018	NV00925
Total Suspended Solids (TSS)	SM 2540D	61		mg/L	1	1.0	9/6/2018	NV00925
Total Nitrogen	Calc.	2.3		mg/L	1	0.22	9/17/2018	NV00925
Total Dissolved Solids (TDS)	SM 2540C	550	QD	mg/L	1	10	9/10/2018	NV00925
Flow Injection Analyses								
Nitrate + Nitrite Nitrogen	EPA 353.2	1.3		mg/L	1	0.020	9/17/2018	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.96		mg/L	0.5	0.20	9/10/2018	NV00925

Customer Sample ID: NTD @ BFD (2) **Collect Date/Time:** 9/4/2018 18:00
WETLAB Sample ID: 18090154-002 **Receive Date:** 9/5/2018 16:30

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Orthophosphate, as P	SM 4500-P E	0.084		mg/L	1	0.010	9/5/2018	NV00925
Total Phosphorous as P	SM 4500-P E	0.24	M	mg/L	1	0.010	9/11/2018	NV00925
Total Suspended Solids (TSS)	SM 2540D	75		mg/L	1	1.0	9/6/2018	NV00925
Total Nitrogen	Calc.	2.3		mg/L	1	0.22	9/17/2018	NV00925
Total Dissolved Solids (TDS)	SM 2540C	520		mg/L	1	10	9/10/2018	NV00925
Flow Injection Analyses								
Nitrate + Nitrite Nitrogen	EPA 353.2	1.3		mg/L	1	0.020	9/17/2018	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	1.0		mg/L	0.5	0.20	9/10/2018	NV00925

Customer Sample ID: NTD @ BFD (3) **Collect Date/Time:** 9/5/2018 00:00
WETLAB Sample ID: 18090154-003 **Receive Date:** 9/5/2018 16:30

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Orthophosphate, as P	SM 4500-P E	0.088		mg/L	1	0.010	9/5/2018	NV00925
Total Phosphorous as P	SM 4500-P E	0.24		mg/L	1	0.010	9/11/2018	NV00925
Total Suspended Solids (TSS)	SM 2540D	69		mg/L	1	1.0	9/6/2018	NV00925
Total Nitrogen	Calc.	2.6		mg/L	1	0.22	9/17/2018	NV00925
Total Dissolved Solids (TDS)	SM 2540C	580	QD	mg/L	1	10	9/10/2018	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Customer Sample ID: NTD @ BFD (3) **Collect Date/Time:** 9/5/2018 00:00
WETLAB Sample ID: 18090154-003 **Receive Date:** 9/5/2018 16:30

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	1.5	mg/L	1	0.020	9/17/2018	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	1.1	mg/L	0.5	0.20	9/10/2018	NV00925

Customer Sample ID: NTD @ BFD (4) **Collect Date/Time:** 9/5/2018 06:00
WETLAB Sample ID: 18090154-004 **Receive Date:** 9/5/2018 16:30

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.086	mg/L	1	0.010	9/5/2018	NV00925
Total Phosphorous as P	SM 4500-P E	0.21	mg/L	1	0.010	9/11/2018	NV00925
Total Suspended Solids (TSS)	SM 2540D	58	mg/L	1	1.0	9/6/2018	NV00925
Total Nitrogen	Calc.	2.4	mg/L	1	0.22	9/17/2018	NV00925
Total Dissolved Solids (TDS)	SM 2540C	570	mg/L	1	10	9/10/2018	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	1.2	mg/L	1	0.020	9/17/2018	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	1.2	mg/L	0.5	0.20	9/10/2018	NV00925

Customer Sample ID: BS @ SBC (1) **Collect Date/Time:** 9/4/2018 12:00
WETLAB Sample ID: 18090154-005 **Receive Date:** 9/5/2018 16:30

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.083	mg/L	1	0.010	9/5/2018	NV00925
Total Phosphorous as P	SM 4500-P E	0.14	mg/L	1	0.010	9/11/2018	NV00925
Total Suspended Solids (TSS)	SM 2540D	13	mg/L	1	1.0	9/6/2018	NV00925
Total Nitrogen	Calc.	1.1	mg/L	1	0.22	9/17/2018	NV00925
Total Dissolved Solids (TDS)	SM 2540C	130	mg/L	1	10	9/10/2018	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	0.38	mg/L	1	0.020	9/17/2018	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.70	mg/L	0.5	0.20	9/10/2018	NV00925

Customer Sample ID: BS @ SBC (2) **Collect Date/Time:** 9/4/2018 18:00
WETLAB Sample ID: 18090154-006 **Receive Date:** 9/5/2018 16:30

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.090	mg/L	1	0.010	9/5/2018	NV00925
Total Phosphorous as P	SM 4500-P E	0.13	mg/L	1	0.010	9/11/2018	NV00925
Total Suspended Solids (TSS)	SM 2540D	11	mg/L	1	1.0	9/6/2018	NV00925
Total Nitrogen	Calc.	0.89	mg/L	1	0.22	9/17/2018	NV00925
Total Dissolved Solids (TDS)	SM 2540C	200	mg/L	1	10	9/10/2018	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	0.39	mg/L	1	0.020	9/17/2018	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.50	mg/L	0.5	0.20	9/17/2018	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Customer Sample ID: BS @ SBC (2) **Collect Date/Time:** 9/4/2018 18:00

WETLAB Sample ID: 18090154-006 **Receive Date:** 9/5/2018 16:30

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID

Customer Sample ID: BS @ SBC (3) **Collect Date/Time:** 9/5/2018 00:00

WETLAB Sample ID: 18090154-007 **Receive Date:** 9/5/2018 16:30

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.086	mg/L	1	0.010	9/5/2018	NV00925
Total Phosphorous as P	SM 4500-P E	0.13	mg/L	1	0.010	9/11/2018	NV00925
Total Suspended Solids (TSS)	SM 2540D	15	mg/L	1	1.0	9/6/2018	NV00925
Total Nitrogen	Calc.	0.90	mg/L	1	0.22	9/17/2018	NV00925
Total Dissolved Solids (TDS)	SM 2540C	240	mg/L	1	10	9/10/2018	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	0.41	mg/L	1	0.020	9/17/2018	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.48	mg/L	0.5	0.20	9/17/2018	NV00925

Customer Sample ID: BS @ SBC (4) **Collect Date/Time:** 9/5/2018 06:00

WETLAB Sample ID: 18090154-008 **Receive Date:** 9/5/2018 16:30

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.088	mg/L	1	0.010	9/5/2018	NV00925
Total Phosphorous as P	SM 4500-P E	0.13	mg/L	1	0.010	9/11/2018	NV00925
Total Suspended Solids (TSS)	SM 2540D	23	mg/L	1	1.0	9/6/2018	NV00925
Total Nitrogen	Calc.	0.92	mg/L	1	0.22	9/17/2018	NV00925
Total Dissolved Solids (TDS)	SM 2540C	200	mg/L	1	10	9/10/2018	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	0.39	mg/L	1	0.020	9/17/2018	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.53	mg/L	0.5	0.20	9/17/2018	NV00925

Customer Sample ID: YD @ SBC (1) **Collect Date/Time:** 9/4/2018 12:00

WETLAB Sample ID: 18090154-009 **Receive Date:** 9/5/2018 16:30

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.020	mg/L	1	0.010	9/5/2018	NV00925
Total Phosphorous as P	SM 4500-P E	0.19	mg/L	1	0.010	9/11/2018	NV00925
Total Suspended Solids (TSS)	SM 2540D	44	mg/L	1	1.0	9/6/2018	NV00925
Total Nitrogen	Calc.	1.6	mg/L	1	0.22	9/17/2018	NV00925
Total Dissolved Solids (TDS)	SM 2540C	280	mg/L	1	10	9/10/2018	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	0.045	mg/L	1	0.020	9/17/2018	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	1.5	mg/L	0.5	0.20	9/17/2018	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Customer Sample ID: YD @ SBC (2) **Collect Date/Time:** 9/4/2018 18:00
WETLAB Sample ID: 18090154-010 **Receive Date:** 9/5/2018 16:30

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Orthophosphate, as P	SM 4500-P E	0.025		mg/L	1	0.010	9/5/2018	NV00925
Total Phosphorous as P	SM 4500-P E	0.18	M	mg/L	1	0.010	9/11/2018	NV00925
Total Suspended Solids (TSS)	SM 2540D	38		mg/L	1	1.0	9/6/2018	NV00925
Total Nitrogen	Calc.	1.4		mg/L	1	0.22	9/17/2018	NV00925
Total Dissolved Solids (TDS)	SM 2540C	270		mg/L	1	10	9/10/2018	NV00925
Flow Injection Analyses								
Nitrate + Nitrite Nitrogen	EPA 353.2	0.042		mg/L	1	0.020	9/17/2018	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	1.3		mg/L	0.5	0.20	9/17/2018	NV00925

Customer Sample ID: YD @ SBC (3) **Collect Date/Time:** 9/5/2018 00:00
WETLAB Sample ID: 18090154-011 **Receive Date:** 9/5/2018 16:30

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Orthophosphate, as P	SM 4500-P E	0.027		mg/L	1	0.010	9/5/2018	NV00925
Total Phosphorous as P	SM 4500-P E	0.17		mg/L	1	0.010	9/12/2018	NV00925
Total Suspended Solids (TSS)	SM 2540D	37		mg/L	1	1.0	9/6/2018	NV00925
Total Nitrogen	Calc.	1.3		mg/L	1	0.22	9/17/2018	NV00925
Total Dissolved Solids (TDS)	SM 2540C	290		mg/L	1	10	9/10/2018	NV00925
Flow Injection Analyses								
Nitrate + Nitrite Nitrogen	EPA 353.2	0.047	M	mg/L	1	0.020	9/17/2018	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	1.2		mg/L	0.5	0.20	9/17/2018	NV00925

Customer Sample ID: YD @ SBC (4) **Collect Date/Time:** 9/5/2018 06:00
WETLAB Sample ID: 18090154-012 **Receive Date:** 9/5/2018 16:30

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Orthophosphate, as P	SM 4500-P E	0.047		mg/L	1	0.010	9/5/2018	NV00925
Total Phosphorous as P	SM 4500-P E	0.25		mg/L	1	0.010	9/12/2018	NV00925
Total Suspended Solids (TSS)	SM 2540D	58		mg/L	1	1.0	9/6/2018	NV00925
Total Nitrogen	Calc.	1.4		mg/L	1	0.22	9/17/2018	NV00925
Total Dissolved Solids (TDS)	SM 2540C	290		mg/L	1	10	9/10/2018	NV00925
Flow Injection Analyses								
Nitrate + Nitrite Nitrogen	EPA 353.2	0.044		mg/L	1	0.020	9/17/2018	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	1.4		mg/L	0.5	0.20	9/17/2018	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Western Environmental Testing Laboratory
QC Report

QCBatchID	QCType	Parameter	Method	Result	Actual	% Rec	Units
QC18090131	Blank 1	Orthophosphate, as P	SM 4500-P E	ND			mg/L
QC18090289	Blank 1	Total Suspended Solids (TSS)	SM 2540D	ND			mg/L
QC18090296	Blank 1	Total Kjeldahl Nitrogen	EPA 351.2	ND			mg/L
QC18090306	Blank 1	Total Phosphorous as P	SM 4500-P E	ND			mg/L
QC18090355	Blank 1	Total Phosphorous as P	SM 4500-P E	ND			mg/L
QC18090398	Blank 1	Total Phosphorous as P	SM 4500-P E	ND			mg/L
QC18090420	Blank 1	Total Dissolved Solids (TDS)	SM 2540C	ND			mg/L
QC18090421	Blank 1	Total Dissolved Solids (TDS)	SM 2540C	ND			mg/L
QC18090552	Blank 1	Nitrate + Nitrite Nitrogen	EPA 353.2	ND			mg/L
QC18090555	Blank 1	Nitrate + Nitrite Nitrogen	EPA 353.2	ND			mg/L
QC18090566	Blank 1	Total Kjeldahl Nitrogen	EPA 351.2	ND			mg/L

QCBatchID	QCType	Parameter	Method	Result	Actual	% Rec	Units
QC18090131	LCS 1	Orthophosphate, as P	SM 4500-P E	0.252	0.250	101	mg/L
QC18090289	LCS 1	Total Suspended Solids (TSS)	SM 2540D	199	200	99	mg/L
QC18090289	LCS 2	Total Suspended Solids (TSS)	SM 2540D	198	200	99	mg/L
QC18090296	LCS 1	Total Kjeldahl Nitrogen	EPA 351.2	0.965	1.00	96	mg/L
QC18090306	LCS 1	Total Phosphorous as P	SM 4500-P E	0.275	0.250	110	mg/L
QC18090355	LCS 1	Total Phosphorous as P	SM 4500-P E	0.247	0.250	99	mg/L
QC18090398	LCS 1	Total Phosphorous as P	SM 4500-P E	0.272	0.250	109	mg/L
QC18090420	LCS 1	Total Dissolved Solids (TDS)	SM 2540C	139	150	93	mg/L
QC18090420	LCS 2	Total Dissolved Solids (TDS)	SM 2540C	140	150	93	mg/L
QC18090421	LCS 1	Total Dissolved Solids (TDS)	SM 2540C	137	150	91	mg/L
QC18090421	LCS 2	Total Dissolved Solids (TDS)	SM 2540C	140	150	93	mg/L
QC18090552	LCS 1	Nitrate + Nitrite Nitrogen	EPA 353.2	0.828	0.800	104	mg/L
QC18090555	LCS 1	Nitrate + Nitrite Nitrogen	EPA 353.2	0.825	0.800	103	mg/L
QC18090566	LCS 1	Total Kjeldahl Nitrogen	EPA 351.2	0.945	1.00	94	mg/L

QCBatchID	QCType	Parameter	Method	Duplicate Sample	Sample Result	Duplicate Result		Units	RPD
QC18090289	Duplicate 2	Total Suspended Solids (TSS)	SM 2540D	18090154-00	23.3	24.0		mg/L	3 %
QC18090420	Duplicate 1	Total Dissolved Solids (TDS)	SM 2540C	18090154-00	547	598	QD	mg/L	9 %
QC18090420	Duplicate 2	Total Dissolved Solids (TDS)	SM 2540C	18090154-00	579	539	QD	mg/L	7 %
QC18090421	Duplicate 1	Total Dissolved Solids (TDS)	SM 2540C	18090236-00	384	394		mg/L	3 %
QC18090421	Duplicate 2	Total Dissolved Solids (TDS)	SM 2540C	18090154-01	294	296		mg/L	1 %

QCBatchID	QCType	Parameter	Method	Spike Sample	Sample Result		MS Result	MSD Result	Spike Value	Units	MS %Rec	MSD %Rec	RPD %
QC18090131	MS 1	Orthophosphate, as P	SM 4500-P E	18090154-00	0.087		0.322	0.335	0.25	mg/L	94	99	4
QC18090131	MS 2	Orthophosphate, as P	SM 4500-P E	18090154-01	0.027		0.266	0.273	0.25	mg/L	95	98	3
QC18090296	MS 1	Total Kjeldahl Nitrogen	EPA 351.2	18081024-00	0.675	M	1.90	1.12	0.5	mg/L	NC	NC	NC
QC18090296	MS 2	Total Kjeldahl Nitrogen	EPA 351.2	18090153-00	ND		0.455	0.480	0.5	mg/L	91	96	5
QC18090306	MS 1	Total Phosphorous as P	SM 4500-P E	18090034-00	0.352		0.630	0.652	0.25	mg/L	111	120	3
QC18090306	MS 2	Total Phosphorous as P	SM 4500-P E	18090141-00	8.44	SC	12.4	12.1	0.25	mg/L	NC	NC	NC
QC18090355	MS 1	Total Phosphorous as P	SM 4500-P E	18090154-00	0.242	M	0.735	0.766	0.25	mg/L	NC	NC	NC
QC18090355	MS 2	Total Phosphorous as P	SM 4500-P E	18090154-01	0.180	M	0.712	0.749	0.25	mg/L	NC	NC	NC
QC18090398	MS 1	Total Phosphorous as P	SM 4500-P E	18090154-01	0.171		0.413	0.457	0.25	mg/L	97	114	10

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

QCBatchID	QCType	Parameter	Method	Spike Sample	Sample Result		MS Result	MSD Result	Spike Value	Units	MS %Rec	MSD %Rec	RPD %
QC18090398	MS 2	Total Phosphorous as P	SM 4500-P E	18090245-00	0.148	M	0.325	0.327	0.25	mg/L	NC	NC	NC
QC18090552	MS 1	Nitrate + Nitrite Nitrogen	EPA 353.2	18090154-01	0.047	M	1.16	1.16	1	mg/L	NC	NC	NC
QC18090552	MS 2	Nitrate + Nitrite Nitrogen	EPA 353.2	18090198-00	ND	M	5.66	5.66	1	mg/L	NC	NC	NC
QC18090555	MS 1	Nitrate + Nitrite Nitrogen	EPA 353.2	1808858-003	0.170	M	5.68	5.67	1	mg/L	NC	NC	NC
QC18090555	MS 2	Nitrate + Nitrite Nitrogen	EPA 353.2	18090154-00	1.33		2.36	2.37	1	mg/L	103	104	<1
QC18090566	MS 1	Total Kjeldahl Nitrogen	EPA 351.2	18090154-00	0.505		0.970	0.935	0.5	mg/L	93	86	4
QC18090566	MS 2	Total Kjeldahl Nitrogen	EPA 351.2	18090245-00	0.860	M	1.42	1.42	0.5	mg/L	NC	NC	NC

WETLAB
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Specializing in Soil, Hazardous Waste and Water Analysis.
475 E. Greg Street #119 | Sparks, Nevada 89431 | www.WETLaboratory.com
tel (775) 355-0202 | fax (775) 355-0817
1084 Lamoille Highway | Elko, Nevada 89801
tel (775) 777-9933 | fax (775) 777-9933
3230 Polaris Ave., Suite 4 | Las Vegas, Nevada 89102
tel (702) 475-8899 | fax (702) 776-6152

WETLAB Order ID. 18090154
Sparks Control #
Elko Control #
LV Control #
Report Due Date
Page 1 of 2

Client Balance Hydrologics
Address 12020 Donner Pass Rd Suite B1
City, State & Zip Truckee CA 96161
Contact Brian Hastings
Phone 530.550.9776
Collector's Name BT
Fax
PWS/Project Name
P.O. Number
PWS/Project Number 213136
Email bhastings@Balancehydro.com

Turnaround Time Requirements
Standard ____
5 Day* (25%) ____ 72 Hour* (50%) ____
48 Hour* (100%) ____ 24 Hour* (200%) ____
*Surcharges Will Apply

Samples Collected From Which State?
NV ____ CA ____
Other ____

Compliance Monitoring?
Yes No

Report to Regulatory Agency?
Yes No

Report Results Via
PDF EDD
Other ____

Standard QC Required?
Yes No

Billing Address (if different than Client Address)
Company Balance Hydrologics
Address 800 Bancroft Way Suite 101
City, State & Zip Berkeley CA ~~9~~94710
Contact Rachel Boitano
Phone 510-704-1000 Fax
Email rboitano@balancehydro.com

Analyses Requested

SAMPLE ID/LOCATION	DATE	TIME	PRES TYPE *	SAMPLE TYPE **	NO. OF CONTAINERS	Total N	Total P	Ortho P	TSS	TDS						Spl. No.
NTD @ BFD (1)	9/4/18	12:00		Aq	2	X	X	X	X	X						1
NTD @ BFD (2)	9/4/18	18:00		|	|	X	X	X	X	X						2
NTD @ BFD (3)	9/5/18	0:00		|	|	X	X	X	X	X						3
NTD @ BFD (4)	9/5/18	6:00		|	|	X	X	X	X	X						4
BS @ SBC (1)	9/4/18	12:00		|	|	X	X	X	X	X						5
BS @ SBC (2)	9/4/18	18:00		|	|	X	X	X	X	X						6
BS @ SBC (3)	9/5/18	0:00		|	|	X	X	X	X	X						7
BS @ SBC (4)	9/5/18	6:00		|	|	X	X	X	X	X						8

Instructions/Comments/Special Requirements:

Sample Matrix Key** DW = Drinking Water WW = Wastewater SW = Surface Water MW = Monitoring Well SD = Solid/Sludge SO = Soil HW = Hazardous Waste OTHER: ____

***SAMPLE PRESERVATIVES:** 1=Unpreserved 2=H2SO4 3=NaOH 4=HCl 5=HNO3 6=Na2S2O3 7=ZnOAc+NaOH 8=HCl/VOA Vial

Temp	Custody Seal	# of Containers	DATE	TIME	Samples Relinquished By	Samples Received By
9.2 °C	Y N [✓ None]		9/5/18	11:30		
°C	Y N None					
°C	Y N None					
°C	Y N None					

WETLAB'S Standard Terms and Conditions apply unless written agreements specify otherwise. Payment terms are Net 30.

Client/Collector attests to the validity and authenticity of this (these) sample(s) and, is (are) aware that tampering with or intentionally mislabeling the sample(s) location, date or time of collection may be considered fraud and subject to legal action (NAC445.0636). ________ initial

To the maximum extent permitted by law, the Client agrees to limit the liability of WETLAB for the Client's damages to the total compensation received, unless other agreements are made in writing. This limitation shall apply regardless of the cause of action or legal theory pled or asserted. ________ initial

WETLAB will dispose of samples 90 days from sample receipt. Client may request a longer sample storage time for an additional fee. Please contact your Project Manager for details. ________ initial

WETLAB
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3230 Polaris Ave., Suite 4 | Las Vegas, Nevada 89102
tel (702) 475-8899 | fax (702) 776-6152

WETLAB Order ID. 1809154
Sparks Control # ______
Elko Control # ______
LV Control # ______
Report Due Date ______
Page 2 of 2

Client
Address
City, State & Zip
Contact
Phone
Collector's Name
Fax
PWS/Project Name
P.O. Number
PWS/Project Number
Email

Turnaround Time Requirements
Standard ______
5 Day* (25%) ______ 72 Hour* (50%) ______
48 Hour* (100%) ______ 24 Hour* (200%) ______
*Surcharges Will Apply

Samples Collected From Which State?
NV____ CA____
Other____

Compliance Monitoring?
Yes No

Report Results Via
PDF EDD
Other ______

Report to Regulatory Agency?
Yes No

Standard QC Required?
Yes No

Billing Address (if different than Client Address)
Company ______
Address ______
City, State & Zip ______
Contact ______
Phone ______ Fax ______
Email

SAMPLE ID/LOCATION	DATE	TIME	PRES TYPE *	SAMPLE TYPE **	NO. OF CONTAINERS	Total N	Total P	Ortho P	TSS	TDS						Spl. No.
YD@SBC (1)	9/4/18	12:00		Aq	2	X	X	X	X	X						9
YD@SBC (2)	9/4/18	18:00				X	X	X	X	X						10
YD@SBC (3)	9/5/18	0:00				X	X	X	X	X						11
YD@SBC (4)	9/5/18	6:00				X	X	X	X	X						12

Instructions/Comments/Special Requirements:

Sample Matrix Key** **DW** = Drinking Water **WW** = Wastewater **SW** = Surface Water **MW** = Monitoring Well **SD** = Solid/Sludge **SO** = Soil **HW** = Hazardous Waste **OTHER:** ______

***SAMPLE PRESERVATIVES:** 1=Unpreserved 2=H2SO4 3=NaOH 4=HCl 5=HNO3 6=Na2S2O3 7=ZnOAc+NaOH 8=HCl/VOA Vial

Temp	Custody Seal	# of Containers	DATE	TIME	Samples Relinquished By	Samples Received By
9.2 °C	Y N [✓ None]		9/5/18	1630	X	
°C	Y N None					
°C	Y N None					
°C	Y N None					

WETLAB'S Standard Terms and Conditions apply unless written agreements specify otherwise. Payment terms are Net 30.

Client/Collector attests to the validity and authenticity of this (these) sample(s) and, is (are) aware that tampering with or intentionally mislabeling the sample(s) location, date or time of collection may be considered fraud and subject to legal action (NAC445.0636). ______ initial

To the maximum extent permitted by law, the Client agrees to limit the liability of WETLAB for the Client's damages to the total compensation received, unless other agreements are made in writing. This limitation shall apply regardless of the cause of action or legal theory pled or asserted. ______ initial

WETLAB will dispose of samples 90 days from sample receipt. Client may request a longer sample storage time for an additional fee. Please contact your Project Manager for details. ______ initial

301.2E

WETLAB
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Specializing in Soil, Hazardous Waste and Water Analysis

9/21/2018

Balance Hydrologics
800 Baucroft Ave. Suite 101
Berkeley, CA 94710
Attn: Brian Hastings

OrderID: *18090245*

Dear: Brian Hastings

This is to transmit the attached analytical report. The analytical data and information contained therein was generated using specified or selected methods contained in references, such as Standard Methods for the Examination of Water and Wastewater, online edition, Methods for Determination of Organic Compounds in Drinking Water, EPA-600/4-79-020, and Test Methods for Evaluation of Solid Waste, Physical/Chemical Methods (SW846) Third Edition.

The samples were received by WETLAB-Western Environmental Testing Laboratory in good condition on 9/7/2018. Additional comments are located on page 2 of this report.

If you should have any questions or comments regarding this report, please do not hesitate to call.

Sincerely,

Andy Smith
QA Manager

Western Environmental Testing Laboratory
Report Comments

Balance Hydrologics - 18090245

Specific Report Comments

None

Report Legend

B -- Blank contamination; Analyte detected above the method reporting limit in an associated blank

D -- Due to the sample matrix dilution was required in order to properly detect and report the analyte. The reporting limit has been adjusted accordingly.

HT -- Sample analyzed beyond the accepted holding time

J -- The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit

M -- The matrix spike/matrix spike duplicate (MS/MSD) values for the analysis of this parameter were outside acceptance criteria due to probable matrix interference. The reported result should be considered an estimate.

N -- There was insufficient sample available to perform a spike and/or duplicate on this analytical batch.

NC -- Not calculated due to matrix interference

QD -- The sample duplicate or matrix spike duplicate analysis demonstrated sample imprecision. The reported result should be considered an estimate.

QL -- The result for the laboratory control sample (LCS) was outside WETLAB acceptance criteria and reanalysis was not possible. The reported data should be considered an estimate.

S -- Surrogate recovery was outside of laboratory acceptance limits due to matrix interference. The associated blank and LCS surrogate recovery was within acceptance limits

SC -- Spike recovery not calculated. Sample concentration >4X the spike amount; therefore, the spike could not be adequately recovered

U -- The analyte was analyzed for, but was not detected above the level of the reported sample reporting/quantitation limit

General Lab Comments

Per method recommendation (section 4.4), Samples analyzed by methods EPA 300.0 and EPA 300.1 have been filtered prior to analysis.

The following is an interpretation of the results from EPA method 9223B:
A result of zero (0) indicates absence for both coliform and Escherichia coli meaning the water meets the microbiological requirements of the U.S. EPA Safe Drinking Water Act (SDWA). A result of one (1) for either test indicates presence and the water does not meet the SDWA requirements. Waters with positive tests should be disinfected by a certified water treatment operator and retested.

Per federal regulation the holding time for the following parameters in aqueous/water samples is 15 minutes: Residual Chlorine, pH, Dissolved Oxygen, Sulfite.

Western Environmental Testing Laboratory
Analytical Report

Balance Hydrologics
800 Baucroft Ave. Suite 101
Berkeley, CA 94710
Attn: Brian Hastings
Phone: (510-704-1000 **Fax:**
PO\Project: *213136*

Date Printed: 9/21/2018
OrderID: *18090245*

Customer Sample ID: SBC @ CWW (1) **Collect Date/Time:** 9/6/2018 12:00
WETLAB Sample ID: 18090245-001 **Receive Date:** 9/7/2018 15:00

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Orthophosphate, as P	SM 4500-P E	0.15		mg/L	1	0.010	9/7/2018	NV00925
Total Phosphorous as P	SM 4500-P E	0.15	M	mg/L	1	0.010	9/12/2018	NV00925
Total Suspended Solids (TSS)	SM 2540D	72		mg/L	1	1.0	9/7/2018	NV00925
Total Nitrogen	Calc.	1.2		mg/L	1	0.22	9/19/2018	NV00925
Total Dissolved Solids (TDS)	SM 2540C	390		mg/L	1	10	9/7/2018	NV00925
Flow Injection Analyses								
Nitrate + Nitrite Nitrogen	EPA 353.2	0.19		mg/L	1	0.020	9/19/2018	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.98		mg/L	0.5	0.20	9/17/2018	NV00925

Customer Sample ID: SBC @ CWW (2) **Collect Date/Time:** 9/6/2018 18:00
WETLAB Sample ID: 18090245-002 **Receive Date:** 9/7/2018 15:00

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Orthophosphate, as P	SM 4500-P E	0.14		mg/L	1	0.010	9/7/2018	NV00925
Total Phosphorous as P	SM 4500-P E	0.14		mg/L	1	0.010	9/12/2018	NV00925
Total Suspended Solids (TSS)	SM 2540D	67		mg/L	1	1.0	9/7/2018	NV00925
Total Nitrogen	Calc.	1.1		mg/L	1	0.22	9/19/2018	NV00925
Total Dissolved Solids (TDS)	SM 2540C	360		mg/L	1	10	9/7/2018	NV00925
Flow Injection Analyses								
Nitrate + Nitrite Nitrogen	EPA 353.2	0.21		mg/L	1	0.020	9/19/2018	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.86	M	mg/L	0.5	0.20	9/17/2018	NV00925

Customer Sample ID: SBC @ CWW (3) **Collect Date/Time:** 9/7/2018 00:00
WETLAB Sample ID: 18090245-003 **Receive Date:** 9/7/2018 15:00

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.20	mg/L	1	0.010	9/7/2018	NV00925
Total Phosphorous as P	SM 4500-P E	0.15	mg/L	1	0.010	9/12/2018	NV00925
Total Suspended Solids (TSS)	SM 2540D	77	mg/L	1	1.0	9/7/2018	NV00925
Total Nitrogen	Calc.	1.1	mg/L	1	0.22	9/19/2018	NV00925
Total Dissolved Solids (TDS)	SM 2540C	400	mg/L	1	10	9/7/2018	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Customer Sample ID: SBC @ CWW (3) **Collect Date/Time:** 9/7/2018 00:00

WETLAB Sample ID: 18090245-003 **Receive Date:** 9/7/2018 15:00

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	0.20	mg/L	1	0.020	9/19/2018	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.89	mg/L	0.5	0.20	9/17/2018	NV00925

Customer Sample ID: SBC @ CWW (4) **Collect Date/Time:** 9/7/2018 06:00

WETLAB Sample ID: 18090245-004 **Receive Date:** 9/7/2018 15:00

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.19	mg/L	1	0.010	9/7/2018	NV00925
Total Phosphorous as P	SM 4500-P E	0.28	mg/L	1	0.010	9/12/2018	NV00925
Total Suspended Solids (TSS)	SM 2540D	37	mg/L	1	1.0	9/7/2018	NV00925
Total Nitrogen	Calc.	1.0	mg/L	1	0.22	9/19/2018	NV00925
Total Dissolved Solids (TDS)	SM 2540C	450	mg/L	1	10	9/7/2018	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	0.20	mg/L	1	0.020	9/19/2018	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.83	mg/L	0.5	0.20	9/17/2018	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Western Environmental Testing Laboratory
QC Report

QCBatchID	QCType	Parameter	Method	Result	Actual	% Rec	Units
QC18090249	Blank 1	Orthophosphate, as P	SM 4500-P E	ND			mg/L
QC18090317	Blank 1	Total Suspended Solids (TSS)	SM 2540D	ND			mg/L
QC18090328	Blank 1	Total Dissolved Solids (TDS)	SM 2540C	ND			mg/L
QC18090398	Blank 1	Total Phosphorous as P	SM 4500-P E	ND			mg/L
QC18090566	Blank 1	Total Kjeldahl Nitrogen	EPA 351.2	ND			mg/L
QC18090666	Blank 1	Nitrate + Nitrite Nitrogen	EPA 353.2	ND			mg/L

QCBatchID	QCType	Parameter	Method	Result	Actual	% Rec	Units
QC18090249	LCS 1	Orthophosphate, as P	SM 4500-P E	0.242	0.250	97	mg/L
QC18090317	LCS 1	Total Suspended Solids (TSS)	SM 2540D	197	200	99	mg/L
QC18090317	LCS 2	Total Suspended Solids (TSS)	SM 2540D	196	200	98	mg/L
QC18090328	LCS 1	Total Dissolved Solids (TDS)	SM 2540C	143	150	95	mg/L
QC18090328	LCS 2	Total Dissolved Solids (TDS)	SM 2540C	140	150	93	mg/L
QC18090398	LCS 1	Total Phosphorous as P	SM 4500-P E	0.272	0.250	109	mg/L
QC18090566	LCS 1	Total Kjeldahl Nitrogen	EPA 351.2	0.945	1.00	94	mg/L
QC18090666	LCS 1	Nitrate + Nitrite Nitrogen	EPA 353.2	0.823	0.800	103	mg/L

QCBatchID	QCType	Parameter	Method	Duplicate Sample	Sample Result	Duplicate Result	Units	RPD
QC18090317	Duplicate 1	Total Suspended Solids (TSS)	SM 2540D	18090178-00	13.7	12.7	mg/L	8 %
QC18090317	Duplicate 2	Total Suspended Solids (TSS)	SM 2540D	18090196-00	4.33	4.33	mg/L	<1%
QC18090328	Duplicate 1	Total Dissolved Solids (TDS)	SM 2540C	18090245-00	401	398	mg/L	1 %

QCBatchID	QCType	Parameter	Method	Spike Sample	Sample Result		MS Result	MSD Result	Spike Value	Units	MS %Rec	MSD %Rec	RPD %
QC18090249	MS 1	Orthophosphate, as P	SM 4500-P E	18090245-00	0.152		0.425	0.428	0.25	mg/L	109	111	<1
QC18090398	MS 1	Total Phosphorous as P	SM 4500-P E	18090154-01	0.171		0.413	0.457	0.25	mg/L	97	114	10
QC18090398	MS 2	Total Phosphorous as P	SM 4500-P E	18090245-00	0.148	M	0.325	0.327	0.25	mg/L	NC	NC	NC
QC18090566	MS 1	Total Kjeldahl Nitrogen	EPA 351.2	18090154-00	0.505		0.970	0.935	0.5	mg/L	93	86	4
QC18090566	MS 2	Total Kjeldahl Nitrogen	EPA 351.2	18090245-00	0.860	M	1.42	1.42	0.5	mg/L	NC	NC	NC
QC18090666	MS 1	Nitrate + Nitrite Nitrogen	EPA 353.2	18081009-00	2.65		7.46	7.95	1	mg/L	96	106	6
QC18090666	MS 2	Nitrate + Nitrite Nitrogen	EPA 353.2	18090237-00	0.310		1.35	1.34	1	mg/L	104	103	<1

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

WETLAB
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1084 Lamoille Highway | Elko, Nevada 89801
tel (775) 777-9933 | fax (775) 777-9933
3230 Polaris Ave., Suite 4 | Las Vegas, Nevada 89102
tel (702) 475-8899 | fax (702) 776-6152

WETLAB Order ID. 1809245
Sparks Control # ______
Elko Control # ______
LV Control # ______
Report Due Date ______
Page 1 of 1

Client: Balance Hydrologics
Address: 12020 Donner Pass Rd. Suite B1
City, State & Zip: Truckee CA 96161
Contact: Brian Hastings
Phone: 530-550-9776
Collector's Name: BT
Fax:
PWS/Project Name:
P.O. Number:
PWS/Project Number: 213136
Email: brianhastings@balancehydro.com

Turnaround Time Requirements
Standard [✓ X]
5 Day* (25%) ______ 72 Hour* (50%) ______
48 Hour* (100%) ______ 24 Hour* (200%) ______
*Surcharges Will Apply

Samples Collected From Which State?
NV ____ CA ____ Other ____

Report Results Via
PDF EDD Other ______

Compliance Monitoring? Yes No

Report to Regulatory Agency? Yes No

Standard QC Required? Yes No

Billing Address (if different than Client Address)
Company: Balance Hydrologics
Address: 800 Bancroft Way Suite 101
City, State & Zip: Berkeley CA 94710
Contact: Rachel Boitano
Phone: 510-704-1000 Fax: ______
Email: rboitano@balancehydro.com

SAMPLE ID/LOCATION	DATE	TIME	PRES TYPE *	SAMPLE TYPE **	NO. OF CONTAINERS	Total N	Total P	Ortho P	TSS	TDS						Spl. No.
SBC @ CWW (1)	9/6/18	12:00		Aq	2	X	X	X	X	X						
SBC @ CWW (2)	9/6/18	18:00			2	X	X	X	X	X						
SBC @ CWW (3)	9/7/18	0:00			2	X	X	X	X	X						
SBC @ CWW (4)	9/7/18	6:00			2	X	X	X	X	X						

1809 2
0245 4

Instructions/Comments/Special Requirements:

Sample Matrix Key** DW = Drinking Water WW = Wastewater SW = Surface Water MW = Monitoring Well SD = Solid/Sludge SO = Soil HW = Hazardous Waste OTHER: ______

***SAMPLE PRESERVATIVES:** 1=Unpreserved 2=H2SO4 3=NaOH 4=HCl 5=HNO3 6=Na2S2O3 7=ZnOAc+NaOH 8=HCl/VOA Vial

Temp	Custody Seal	# of Containers	DATE	TIME	Samples Relinquished By	Samples Received By
17.8 °C	Y N [✓ None]	8	9/7/18	1500		
°C	Y N None					
°C	Y N None					
°C	Y N None					

WETLAB'S Standard Terms and Conditions apply unless written agreements specify otherwise. Payment terms are Net 30.

Client/Collector attests to the validity and authenticity of this (these) sample(s) and, is (are) aware that tampering with or intentionally mislabeling the sample(s) location, date or time of collection may be considered fraud and subject to legal action (NAC445.0636). ______ initial

To the maximum extent permitted by law, the Client agrees to limit the liability of WETLAB for the Client's damages to the total compensation received, unless other agreements are made in writing. This limitation shall apply regardless of the cause of action or legal theory pled or asserted. ______ initial

WETLAB will dispose of samples 90 days from sample receipt. Client may request a longer sample storage time for an additional fee. Please contact your Project Manager for details. ______ initial

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10/18/2018

Balance Hydrologics
800 Baucroft Ave. Suite 101
Berkeley, CA 94710
Attn: Brian Hastings

OrderID: *18100206*

Dear: Brian Hastings

This is to transmit the attached analytical report. The analytical data and information contained therein was generated using specified or selected methods contained in references, such as Standard Methods for the Examination of Water and Wastewater, online edition, Methods for Determination of Organic Compounds in Drinking Water, EPA-600/4-79-020, and Test Methods for Evaluation of Solid Waste, Physical/Chemical Methods (SW846) Third Edition.

The samples were received by WETLAB-Western Environmental Testing Laboratory in good condition on 10/4/2018. Additional comments are located on page 2 of this report.

If you should have any questions or comments regarding this report, please do not hesitate to call.

Sincerely,

Jennifer Delaney

Jennifer Delaney
QA Specialist

Western Environmental Testing Laboratory
Report Comments

Balance Hydrologics - 18100206

Specific Report Comments

None

Report Legend

B	--	Blank contamination; Analyte detected above the method reporting limit in an associated blank
D	--	Due to the sample matrix dilution was required in order to properly detect and report the analyte. The reporting limit has been adjusted accordingly.
HT	--	Sample analyzed beyond the accepted holding time
J	--	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit
M	--	The matrix spike/matrix spike duplicate (MS/MSD) values for the analysis of this parameter were outside acceptance criteria due to probable matrix interference. The reported result should be considered an estimate.
N	--	There was insufficient sample available to perform a spike and/or duplicate on this analytical batch.
NC	--	Not calculated due to matrix interference
QD	--	The sample duplicate or matrix spike duplicate analysis demonstrated sample imprecision. The reported result should be considered an estimate.
QL	--	The result for the laboratory control sample (LCS) was outside WETLAB acceptance criteria and reanalysis was not possible. The reported data should be considered an estimate.
S	--	Surrogate recovery was outside of laboratory acceptance limits due to matrix interference. The associated blank and LCS surrogate recovery was within acceptance limits
SC	--	Spike recovery not calculated. Sample concentration >4X the spike amount; therefore, the spike could not be adequately recovered
U	--	The analyte was analyzed for, but was not detected above the level of the reported sample reporting/quantitation limit

General Lab Comments

Per method recommendation (section 4.4), Samples analyzed by methods EPA 300.0 and EPA 300.1 have been filtered prior to analysis.

The following is an interpretation of the results from EPA method 9223B:
A result of zero (0) indicates absence for both coliform and Escherichia coli meaning the water meets the microbiological requirements of the U.S. EPA Safe Drinking Water Act (SDWA). A result of one (1) for either test indicates presence and the water does not meet the SDWA requirements. Waters with positive tests should be disinfected by a certified water treatment operator and retested.

Per federal regulation the holding time for the following parameters in aqueous/water samples is 15 minutes: Residual Chlorine, pH, Dissolved Oxygen, Sulfite.

Western Environmental Testing Laboratory
Analytical Report

Balance Hydrologics
800 Baucroft Ave. Suite 101
Berkeley, CA 94710
Attn: Brian Hastings
Phone: (510-704-1000 **Fax:**
PO\Project: *City of Reno / 213136*

Date Printed: 10/18/2018
OrderID: *18100206*

Customer Sample ID: TC @ SMP
WETLAB Sample ID: 18100206-001

Collect Date/Time: 10/3/2018 16:05
Receive Date: 10/4/2018 11:55

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Orthophosphate, as P	SM 4500-P E	0.049	M	mg/L	1	0.010	10/4/2018	NV00925
Total Phosphorous as P	SM 4500-P E	0.14		mg/L	1	0.010	10/5/2018	NV00925
Total Suspended Solids (TSS)	SM 2540D	20		mg/L	1	1.0	10/5/2018	NV00925
Total Nitrogen	Calc.	0.76		mg/L	1	0.22	10/16/2018	NV00925
Total Dissolved Solids (TDS)	SM 2540C	83		mg/L	1	10	10/9/2018	NV00925
Flow Injection Analyses								
Nitrate + Nitrite Nitrogen	EPA 353.2	0.16		mg/L	1	0.020	10/16/2018	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.60		mg/L	0.5	0.20	10/5/2018	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Western Environmental Testing Laboratory
QC Report

QCBatchID	QCType	Parameter	Method	Result	Actual	% Rec	Units
QC18100203	Blank 1	Orthophosphate, as P	SM 4500-P E	ND			mg/L
QC18100263	Blank 1	Total Kjeldahl Nitrogen	EPA 351.2	ND			mg/L
QC18100280	Blank 1	Total Phosphorous as P	SM 4500-P E	ND			mg/L
QC18100329	Blank 1	Total Suspended Solids (TSS)	SM 2540D	ND			mg/L
QC18100454	Blank 1	Total Dissolved Solids (TDS)	SM 2540C	ND			mg/L
QC18100642	Blank 1	Nitrate + Nitrite Nitrogen	EPA 353.2	ND			mg/L

QCBatchID	QCType	Parameter	Method	Result	Actual	% Rec	Units
QC18100203	LCS 1	Orthophosphate, as P	SM 4500-P E	0.239	0.250	96	mg/L
QC18100263	LCS 1	Total Kjeldahl Nitrogen	EPA 351.2	1.06	1.00	106	mg/L
QC18100280	LCS 1	Total Phosphorous as P	SM 4500-P E	0.227	0.250	91	mg/L
QC18100329	LCS 1	Total Suspended Solids (TSS)	SM 2540D	198	200	99	mg/L
QC18100329	LCS 2	Total Suspended Solids (TSS)	SM 2540D	198	200	99	mg/L
QC18100454	LCS 1	Total Dissolved Solids (TDS)	SM 2540C	135	150	90	mg/L
QC18100454	LCS 2	Total Dissolved Solids (TDS)	SM 2540C	136	150	91	mg/L
QC18100642	LCS 1	Nitrate + Nitrite Nitrogen	EPA 353.2	0.799	0.800	100	mg/L

QCBatchID	QCType	Parameter	Method	Duplicate Sample	Sample Result	Duplicate Result	Units	RPD
QC18100329	Duplicate 1	Total Suspended Solids (TSS)	SM 2540D	18100192-00	168	172	mg/L	2 %
QC18100329	Duplicate 2	Total Suspended Solids (TSS)	SM 2540D	18100265-00	1.00	1.33	mg/L	29 %
QC18100454	Duplicate 1	Total Dissolved Solids (TDS)	SM 2540C	18100217-00	721	736	mg/L	2 %
QC18100454	Duplicate 2	Total Dissolved Solids (TDS)	SM 2540C	18100219-00	3332	3412	mg/L	2 %

QCBatchID	QCType	Parameter	Method	Spike Sample	Sample Result		MS Result	MSD Result	Spike Value	Units	MS %Rec	MSD %Rec	RPD %
QC18100203	MS 1	Orthophosphate, as P	SM 4500-P E	18100206-001	0.049	M	0.208	0.240	0.25	mg/L	NC	NC	NC
QC18100263	MS 1	Total Kjeldahl Nitrogen	EPA 351.2	18100180-001	4.86	SC	5.30	5.30	0.5	mg/L	NC	NC	NC
QC18100263	MS 2	Total Kjeldahl Nitrogen	EPA 351.2	18100173-003	9.28	SC	9.86	9.71	0.5	mg/L	NC	NC	NC
QC18100280	MS 1	Total Phosphorous as P	SM 4500-P E	18100192-001	5.61		11.9	13.7	0.25	mg/L	100	130	14
QC18100642	MS 1	Nitrate + Nitrite Nitrogen	EPA 353.2	18100206-001	0.157		1.19	1.21	1	mg/L	104	105	2
QC18100642	MS 2	Nitrate + Nitrite Nitrogen	EPA 353.2	18100223-025	ND		5.38	5.34	1	mg/L	108	107	<1

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

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tel (775) 777-9933 | fax (775) 777-9933
3230 Polaris Ave., Suite 4 | Las Vegas, Nevada 89102
tel (702) 475-8899 | fax (702) 776-6152

WETLAB Order ID. 18100206
Sparks Control #
Elko Control #
LV Control #
Report Due Date
Page ______ of ______

Client: Balance Hydrologics
Address: 12020 Donner Pass Rd
City, State & Zip: Truckee, CA 96161
Contact: Brian Hastings
Phone: 530-550-9776
Collector's Name: Jack Jacquet
Fax:
PWS/Project Name: City of Reno
P.O. Number:
PWS/Project Number: 213136
Email: bhastings@balancehydro.com

Turnaround Time Requirements
Standard ______
5 Day* (25%) ______ 72 Hour* (50%) ______
48 Hour* (100%) ______ 24 Hour* (200%) ______
*Surcharges Will Apply

Samples Collected From Which State?
NV____ CA____ Other____

Report Results Via
PDF EDD Other ______

Compliance Monitoring?
Yes No

Report to Regulatory Agency?
Yes No

Standard QC Required?
Yes No

Billing Address (If different than Client Address)
Company: Balance Hydrologics
Address: 800 Bancroft Wy Suite 101
City, State & Zip: Berkeley, CA 94710
Contact: Rachel Boitano
Phone: 510-704-1000 Fax:
Email: rboitano@balancehydro.com

Analyses Requested

SAMPLE ID/LOCATION	DATE	TIME	PRES TYPE *	SAMPLE TYPE **	NO OF CONTAINERS	TN	TP	OP	TSS	TDS						Spl. No.
TC @ SMP	10/3/18	16:05				X	X	X	X	X						

1810 2
0206 1

Instructions/Comments/Special Requirements:

Sample Matrix Key** DW = Drinking Water WW = Wastewater SW = Surface Water MW = Monitoring Well SD = Solid/Sludge SO = Soil HW = Hazardous Waste OTHER:______

***SAMPLE PRESERVATIVES:** 1=Unpreserved 2=H2SO4 3=NaOH 4=HCl 5=HNO3 6=Na2S2O3 7=ZnOAc+NaOH 8=HCl/VOA Vial

Temp	Custody Seal	# of Containers	DATE	TIME	Samples Relinquished By	Samples Received By
6.5 °C	Y N [✓ None]	2	10/4/18	1155		
°C	Y N None					
°C	Y N None					
°C	Y N None					

WETLAB'S Standard Terms and Conditions apply unless written agreements specify otherwise. Payment terms are Net 30.

Client/Collector attests to the validity and authenticity of this (these) sample(s) and, is (are) aware that tampering with or intentionally mislabeling the sample(s) location, date or time of collection may be considered fraud and subject to legal action (NAC445.0636). ______ initial

To the maximum extent permitted by law, the Client agrees to limit the liability of WETLAB for the Client's damages to the total compensation received, unless other agreements are made in writing. This limitation shall apply regardless of the cause of action or legal theory pled or asserted. ______ initial

WETLAB will dispose of samples 90 days from sample receipt. Client may request a longer sample storage time for an additional fee. Please contact your Project Manager for details. ______ initial

12/6/2018

Balance Hydrologics
800 Baucroft Ave. Suite 101
Berkeley, CA 94710
Attn: Brian Hastings

OrderID: *18110635*

Dear: Brian Hastings

This is to transmit the attached analytical report. The analytical data and information contained therein was generated using specified or selected methods contained in references, such as Standard Methods for the Examination of Water and Wastewater, online edition, Methods for Determination of Organic Compounds in Drinking Water, EPA-600/4-79-020, and Test Methods for Evaluation of Solid Waste, Physical/Chemical Methods (SW846) Third Edition.

The samples were received by WETLAB-Western Environmental Testing Laboratory in good condition on 11/26/2018. Additional comments are located on page 2 of this report.

If you should have any questions or comments regarding this report, please do not hesitate to call.

Sincerely,

ASmith

Andy Smith
QA Manager

Western Environmental Testing Laboratory
Report Comments

Balance Hydrologics - 18110635

Specific Report Comments

None

Report Legend

B	--	Blank contamination; Analyte detected above the method reporting limit in an associated blank
D	--	Due to the sample matrix dilution was required in order to properly detect and report the analyte. The reporting limit has been adjusted accordingly.
HT	--	Sample analyzed beyond the accepted holding time
J	--	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit
M	--	The matrix spike/matrix spike duplicate (MS/MSD) values for the analysis of this parameter were outside acceptance criteria due to probable matrix interference. The reported result should be considered an estimate.
N	--	There was insufficient sample available to perform a spike and/or duplicate on this analytical batch.
NC	--	Not calculated due to matrix interference
QD	--	The sample duplicate or matrix spike duplicate analysis demonstrated sample imprecision. The reported result should be considered an estimate.
QL	--	The result for the laboratory control sample (LCS) was outside WETLAB acceptance criteria and reanalysis was not possible. The reported data should be considered an estimate.
S	--	Surrogate recovery was outside of laboratory acceptance limits due to matrix interference. The associated blank and LCS surrogate recovery was within acceptance limits
SC	--	Spike recovery not calculated. Sample concentration >4X the spike amount; therefore, the spike could not be adequately recovered
U	--	The analyte was analyzed for, but was not detected above the level of the reported sample reporting/quantitation limit

General Lab Comments

Per method recommendation (section 4.4), Samples analyzed by methods EPA 300.0 and EPA 300.1 have been filtered prior to analysis.

The following is an interpretation of the results from EPA method 9223B:
A result of zero (0) indicates absence for both coliform and Escherichia coli meaning the water meets the microbiological requirements of the U.S. EPA Safe Drinking Water Act (SDWA). A result of one (1) for either test indicates presence and the water does not meet the SDWA requirements. Waters with positive tests should be disinfected by a certified water treatment operator and retested.

Per federal regulation the holding time for the following parameters in aqueous/water samples is 15 minutes: Residual Chlorine, pH, Dissolved Oxygen, Sulfite.

Western Environmental Testing Laboratory
Analytical Report

Balance Hydrologics
800 Baucroft Ave. Suite 101
Berkeley, CA 94710
Attn: Brian Hastings
Phone: (510-704-1000 **Fax:**
PO\Project: *213136*

Date Printed: 12/6/2018
OrderID: *18110635*

Customer Sample ID: C-24 (1)
WETLAB Sample ID: 18110635-001
Collect Date/Time: 11/21/2018 20:01
Receive Date: 11/26/2018 10:40

Analyte	**Method**	**Results**		**Units**	**DF**	**RL**	**Analyzed**	**LabID**
General Chemistry								
Orthophosphate, as P	SM 4500-P E	0.94	HT	mg/L	1	0.010	11/26/2018	NV00925
Total Phosphorous as P	SM 4500-P E	1.5		mg/L	5	0.050	11/28/2018	NV00925
Total Suspended Solids (TSS)	SM 2540D	610		mg/L	1	1.0	11/27/2018	NV00925
Total Nitrogen	Calc.	23		mg/L	1	5.0	12/3/2018	NV00925
Total Dissolved Solids (TDS)	SM 2540C	970		mg/L	1	10	11/27/2018	NV00925
Flow Injection Analyses								
Nitrate + Nitrite Nitrogen	EPA 353.2	2.6		mg/L	2	0.040	12/3/2018	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	21		mg/L	12.5	5.0	11/30/2018	NV00925

Customer Sample ID: C-24 (2)
WETLAB Sample ID: 18110635-002
Collect Date/Time: 11/21/2018 21:02
Receive Date: 11/26/2018 10:40

Analyte	**Method**	**Results**		**Units**	**DF**	**RL**	**Analyzed**	**LabID**
General Chemistry								
Orthophosphate, as P	SM 4500-P E	0.54	HT	mg/L	1	0.010	11/26/2018	NV00925
Total Phosphorous as P	SM 4500-P E	0.84		mg/L	1	0.010	11/28/2018	NV00925
Total Suspended Solids (TSS)	SM 2540D	28		mg/L	1	1.0	11/27/2018	NV00925
Total Nitrogen	Calc.	4.0		mg/L	1	0.22	12/3/2018	NV00925
Total Dissolved Solids (TDS)	SM 2540C	190		mg/L	1	10	11/27/2018	NV00925
Flow Injection Analyses								
Nitrate + Nitrite Nitrogen	EPA 353.2	0.62		mg/L	1	0.020	12/3/2018	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	3.4		mg/L	0.5	0.20	11/30/2018	NV00925

Customer Sample ID: C-24 (3)
WETLAB Sample ID: 18110635-003
Collect Date/Time: 11/21/2018 22:38
Receive Date: 11/26/2018 10:40

Analyte	**Method**	**Results**		**Units**	**DF**	**RL**	**Analyzed**	**LabID**
General Chemistry								
Orthophosphate, as P	SM 4500-P E	0.31	HT	mg/L	1	0.010	11/26/2018	NV00925
Total Phosphorous as P	SM 4500-P E	0.47		mg/L	1	0.010	11/28/2018	NV00925
Total Suspended Solids (TSS)	SM 2540D	12		mg/L	1	1.0	11/27/2018	NV00925
Total Nitrogen	Calc.	2.6		mg/L	1	0.22	12/3/2018	NV00925
Total Dissolved Solids (TDS)	SM 2540C	160		mg/L	1	10	11/27/2018	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Customer Sample ID: C-24 (3) **Collect Date/Time:** 11/21/2018 22:38

WETLAB Sample ID: 18110635-003 **Receive Date:** 11/26/2018 10:40

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	0.45	mg/L	1	0.020	12/3/2018	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	2.2	mg/L	0.5	0.20	11/30/2018	NV00925

Customer Sample ID: C-24 (4) **Collect Date/Time:** 11/22/2018 03:17

WETLAB Sample ID: 18110635-004 **Receive Date:** 11/26/2018 10:40

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.23 HT	mg/L	1	0.010	11/26/2018	NV00925
Total Phosphorous as P	SM 4500-P E	0.98	mg/L	1	0.010	11/28/2018	NV00925
Total Suspended Solids (TSS)	SM 2540D	76	mg/L	1	1.0	11/27/2018	NV00925
Total Nitrogen	Calc.	4.3	mg/L	1	0.22	12/3/2018	NV00925
Total Dissolved Solids (TDS)	SM 2540C	210	mg/L	1	10	11/27/2018	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	0.69	mg/L	1	0.020	12/3/2018	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	3.6	mg/L	0.5	0.20	11/30/2018	NV00925

Customer Sample ID: H-19 (1) **Collect Date/Time:** 11/21/2018 20:00

WETLAB Sample ID: 18110635-005 **Receive Date:** 11/26/2018 10:40

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	1.3 HT	mg/L	2	0.010	11/26/2018	NV00925
Total Phosphorous as P	SM 4500-P E	4.7	mg/L	5	0.050	11/28/2018	NV00925
Total Suspended Solids (TSS)	SM 2540D	550	mg/L	1	1.0	11/27/2018	NV00925
Total Nitrogen	Calc.	12	mg/L	1	2.0	12/3/2018	NV00925
Total Dissolved Solids (TDS)	SM 2540C	1000	mg/L	1	10	11/27/2018	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	1.7	mg/L	1	0.020	12/3/2018	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	11	mg/L	5	2.0	11/30/2018	NV00925

Customer Sample ID: H-19 (2) **Collect Date/Time:** 11/22/2018 04:49

WETLAB Sample ID: 18110635-006 **Receive Date:** 11/26/2018 10:40

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.48 HT	mg/L	1	0.010	11/26/2018	NV00925
Total Phosphorous as P	SM 4500-P E	1.4	mg/L	2	0.020	11/28/2018	NV00925
Total Suspended Solids (TSS)	SM 2540D	240	mg/L	1	1.0	11/28/2018	NV00925
Total Nitrogen	Calc.	5.1	mg/L	1	0.22	12/3/2018	NV00925
Total Dissolved Solids (TDS)	SM 2540C	75	mg/L	1	10	11/28/2018	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	0.70	mg/L	1	0.020	12/3/2018	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	4.4	mg/L	0.5	0.20	11/30/2018	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Customer Sample ID: H-19 (2) **Collect Date/Time:** 11/22/2018 04:49
WETLAB Sample ID: 18110635-006 **Receive Date:** 11/26/2018 10:40

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID

Customer Sample ID: H-19 (3) **Collect Date/Time:** 11/22/2018 05:18
WETLAB Sample ID: 18110635-007 **Receive Date:** 11/26/2018 10:40

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.78 HT	mg/L	1	0.010	11/26/2018	NV00925
Total Phosphorous as P	SM 4500-P E	2.0	mg/L	5	0.050	11/28/2018	NV00925
Total Suspended Solids (TSS)	SM 2540D	250	mg/L	1	1.0	11/28/2018	NV00925
Total Nitrogen	Calc.	5.5	mg/L	1	0.22	12/3/2018	NV00925
Total Dissolved Solids (TDS)	SM 2540C	220	mg/L	1	10	11/28/2018	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	0.75	mg/L	1	0.020	12/3/2018	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	4.7	mg/L	0.5	0.20	11/30/2018	NV00925

Customer Sample ID: H-19 (4) **Collect Date/Time:** 11/22/2018 05:27
WETLAB Sample ID: 18110635-008 **Receive Date:** 11/26/2018 10:40

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	1.0 HT	mg/L	2	0.010	11/26/2018	NV00925
Total Phosphorous as P	SM 4500-P E	2.3	mg/L	5	0.050	11/28/2018	NV00925
Total Suspended Solids (TSS)	SM 2540D	250	mg/L	1	1.0	11/28/2018	NV00925
Total Nitrogen	Calc.	7.4	mg/L	1	0.42	12/3/2018	NV00925
Total Dissolved Solids (TDS)	SM 2540C	390	mg/L	1	10	11/28/2018	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	1.1	mg/L	1	0.020	12/3/2018	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	6.2 SC	mg/L	1	0.40	11/30/2018	NV00925

Customer Sample ID: D-16 (1) **Collect Date/Time:** 11/21/2018 22:20
WETLAB Sample ID: 18110635-009 **Receive Date:** 11/26/2018 10:40

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.71 HT	mg/L	1	0.010	11/26/2018	NV00925
Total Phosphorous as P	SM 4500-P E	2.4	mg/L	5	0.050	11/28/2018	NV00925
Total Suspended Solids (TSS)	SM 2540D	230	mg/L	1	1.0	11/28/2018	NV00925
Total Nitrogen	Calc.	24	mg/L	1	10	12/3/2018	NV00925
Total Dissolved Solids (TDS)	SM 2540C	870	mg/L	1	10	11/28/2018	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	4.7	mg/L	4	0.080	12/3/2018	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	19	mg/L	25	10	11/30/2018	NV00925

Customer Sample ID: D-16 (2) **Collect Date/Time:** 11/22/2018 05:30

WETLAB Sample ID: 18110635-010 **Receive Date:** 11/26/2018 10:40

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Orthophosphate, as P	SM 4500-P E	0.37	HT	mg/L	1	0.010	11/26/2018	NV00925
Total Phosphorous as P	SM 4500-P E	2.4		mg/L	5	0.050	11/28/2018	NV00925
Total Suspended Solids (TSS)	SM 2540D	500		mg/L	1	1.0	11/28/2018	NV00925
Total Nitrogen	Calc.	7.3		mg/L	1	0.42	12/3/2018	NV00925
Total Dissolved Solids (TDS)	SM 2540C	180		mg/L	1	10	11/28/2018	NV00925
Flow Injection Analyses								
Nitrate + Nitrite Nitrogen	EPA 353.2	0.82		mg/L	1	0.020	12/3/2018	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	6.4		mg/L	1	0.40	11/30/2018	NV00925

Customer Sample ID: D-16 (3) **Collect Date/Time:** 11/22/2018 05:57

WETLAB Sample ID: 18110635-011 **Receive Date:** 11/26/2018 10:40

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Orthophosphate, as P	SM 4500-P E	0.38	HT	mg/L	1	0.010	11/26/2018	NV00925
Total Phosphorous as P	SM 4500-P E	1.0	SC	mg/L	5	0.050	11/29/2018	NV00925
Total Suspended Solids (TSS)	SM 2540D	310		mg/L	1	1.0	11/28/2018	NV00925
Total Nitrogen	Calc.	5.0		mg/L	1	0.22	12/3/2018	NV00925
Total Dissolved Solids (TDS)	SM 2540C	110		mg/L	1	10	11/28/2018	NV00925
Flow Injection Analyses								
Nitrate + Nitrite Nitrogen	EPA 353.2	0.61		mg/L	1	0.020	12/3/2018	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	4.4		mg/L	0.5	0.20	11/30/2018	NV00925

Customer Sample ID: D-16 (4) **Collect Date/Time:** 11/22/2018 06:10

WETLAB Sample ID: 18110635-012 **Receive Date:** 11/26/2018 10:40

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Orthophosphate, as P	SM 4500-P E	0.36	HT	mg/L	1	0.010	11/26/2018	NV00925
Total Phosphorous as P	SM 4500-P E	0.82		mg/L	1	0.010	11/29/2018	NV00925
Total Suspended Solids (TSS)	SM 2540D	92		mg/L	1	1.0	11/28/2018	NV00925
Total Nitrogen	Calc.	4.1		mg/L	1	0.22	12/3/2018	NV00925
Total Dissolved Solids (TDS)	SM 2540C	110		mg/L	1	10	11/28/2018	NV00925
Flow Injection Analyses								
Nitrate + Nitrite Nitrogen	EPA 353.2	0.68		mg/L	1	0.020	12/3/2018	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	3.5		mg/L	0.5	0.20	11/30/2018	NV00925

Customer Sample ID: SDOE008936 (1) **Collect Date/Time:** 11/21/2018 21:24

WETLAB Sample ID: 18110635-013 **Receive Date:** 11/26/2018 10:40

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Orthophosphate, as P	SM 4500-P E	0.67	HT	mg/L	1	0.010	11/26/2018	NV00925
Total Phosphorous as P	SM 4500-P E	1.7		mg/L	5	0.050	11/29/2018	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Customer Sample ID: SDOE008936 (1) **Collect Date/Time:** 11/21/2018 21:24
WETLAB Sample ID: 18110635-013 **Receive Date:** 11/26/2018 10:40

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
Total Suspended Solids (TSS)	SM 2540D	420		mg/L	1	1.0	11/28/2018	NV00925
Total Nitrogen	Calc.	19		mg/L	1	5.0	12/3/2018	NV00925
Total Dissolved Solids (TDS)	SM 2540C	640		mg/L	1	10	11/28/2018	NV00925
Flow Injection Analyses								
Nitrate + Nitrite Nitrogen	EPA 353.2	2.3		mg/L	2	0.040	12/3/2018	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	17		mg/L	12.5	5.0	11/30/2018	NV00925

Customer Sample ID: SDOE008936 (4) **Collect Date/Time:** 11/22/2018 11:01
WETLAB Sample ID: 18110635-014 **Receive Date:** 11/26/2018 10:40

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Orthophosphate, as P	SM 4500-P E	0.50	HT	mg/L	1	0.010	11/26/2018	NV00925
Total Phosphorous as P	SM 4500-P E	1.0		mg/L	2	0.020	11/29/2018	NV00925
Total Suspended Solids (TSS)	SM 2540D	56		mg/L	1	1.0	11/28/2018	NV00925
Total Nitrogen	Calc.	4.4		mg/L	1	0.22	12/3/2018	NV00925
Total Dissolved Solids (TDS)	SM 2540C	130		mg/L	1	10	11/28/2018	NV00925
Flow Injection Analyses								
Nitrate + Nitrite Nitrogen	EPA 353.2	0.74		mg/L	1	0.020	12/3/2018	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	3.7		mg/L	0.5	0.20	11/30/2018	NV00925

Customer Sample ID: YD@SBC (1) **Collect Date/Time:** 11/22/2018 08:36
WETLAB Sample ID: 18110635-015 **Receive Date:** 11/26/2018 10:40

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Orthophosphate, as P	SM 4500-P E	0.090	HT	mg/L	1	0.010	11/26/2018	NV00925
Total Phosphorous as P	SM 4500-P E	0.26		mg/L	1	0.010	11/29/2018	NV00925
Total Suspended Solids (TSS)	SM 2540D	65		mg/L	1	1.0	11/28/2018	NV00925
Total Nitrogen	Calc.	3.0		mg/L	1	0.22	12/3/2018	NV00925
Total Dissolved Solids (TDS)	SM 2540C	300		mg/L	1	10	11/28/2018	NV00925
Flow Injection Analyses								
Nitrate + Nitrite Nitrogen	EPA 353.2	1.5		mg/L	1	0.020	12/3/2018	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	1.5		mg/L	0.5	0.20	11/30/2018	NV00925

Customer Sample ID: YD@SBC (2) **Collect Date/Time:** 11/22/2018 09:16
WETLAB Sample ID: 18110635-016 **Receive Date:** 11/26/2018 10:40

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Orthophosphate, as P	SM 4500-P E	0.058	HT	mg/L	1	0.010	11/26/2018	NV00925
Total Phosphorous as P	SM 4500-P E	0.19		mg/L	1	0.010	11/29/2018	NV00925
Total Suspended Solids (TSS)	SM 2540D	28		mg/L	1	1.0	11/28/2018	NV00925
Total Nitrogen	Calc.	2.5		mg/L	1	0.22	12/3/2018	NV00925
Total Dissolved Solids (TDS)	SM 2540C	290		mg/L	1	10	11/28/2018	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Customer Sample ID: YD@SBC (2) **Collect Date/Time:** 11/22/2018 09:16
WETLAB Sample ID: 18110635-016 **Receive Date:** 11/26/2018 10:40

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	1.4	mg/L	1	0.020	12/3/2018	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	1.1	mg/L	0.5	0.20	11/30/2018	NV00925

Customer Sample ID: YD@SBC (3) **Collect Date/Time:** 11/22/2018 11:36
WETLAB Sample ID: 18110635-017 **Receive Date:** 11/26/2018 10:40

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.032 HT	mg/L	1	0.010	11/26/2018	NV00925
Total Phosphorous as P	SM 4500-P E	0.066	mg/L	1	0.010	11/29/2018	NV00925
Total Suspended Solids (TSS)	SM 2540D	24	mg/L	1	1.0	11/28/2018	NV00925
Total Nitrogen	Calc.	2.2	mg/L	1	0.22	12/3/2018	NV00925
Total Dissolved Solids (TDS)	SM 2540C	310	mg/L	1	10	11/28/2018	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	1.4	mg/L	1	0.020	12/3/2018	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.83	mg/L	0.5	0.20	11/30/2018	NV00925

Customer Sample ID: YD@SBC (4) **Collect Date/Time:** 11/22/2018 12:45
WETLAB Sample ID: 18110635-018 **Receive Date:** 11/26/2018 10:40

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.020 HT	mg/L	1	0.010	11/26/2018	NV00925
Total Phosphorous as P	SM 4500-P E	0.066	mg/L	1	0.010	11/29/2018	NV00925
Total Suspended Solids (TSS)	SM 2540D	30	mg/L	1	1.0	11/28/2018	NV00925
Total Nitrogen	Calc.	2.1	mg/L	1	0.22	12/5/2018	NV00925
Total Dissolved Solids (TDS)	SM 2540C	360	mg/L	1	10	11/28/2018	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	1.4	mg/L	1	0.020	12/3/2018	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.74 M	mg/L	0.5	0.20	12/5/2018	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Western Environmental Testing Laboratory
QC Report

QCBatchID	QCType	Parameter	Method	Result	Actual	% Rec	Units
QC18110867	Blank 1	Orthophosphate, as P	SM 4500-P E	ND			mg/L
QC18110868	Blank 1	Orthophosphate, as P	SM 4500-P E	ND			mg/L
QC18110952	Blank 1	Total Suspended Solids (TSS)	SM 2540D	ND			mg/L
QC18110954	Blank 1	Total Suspended Solids (TSS)	SM 2540D	ND			mg/L
QC18110971	Blank 1	Total Phosphorous as P	SM 4500-P E	ND			mg/L
QC18111018	Blank 1	Total Suspended Solids (TSS)	SM 2540D	ND			mg/L
QC18111021	Blank 1	Total Dissolved Solids (TDS)	SM 2540C	ND			mg/L
QC18111025	Blank 1	Total Phosphorous as P	SM 4500-P E	ND			mg/L
QC18111088	Blank 1	Total Dissolved Solids (TDS)	SM 2540C	ND			mg/L
QC18111089	Blank 1	Total Dissolved Solids (TDS)	SM 2540C	ND			mg/L
QC18111090	Blank 1	Total Kjeldahl Nitrogen	EPA 351.2	ND			mg/L
QC18120046	Blank 1	Nitrate + Nitrite Nitrogen	EPA 353.2	ND			mg/L
QC18120047	Blank 1	Nitrate + Nitrite Nitrogen	EPA 353.2	ND			mg/L
QC18120139	Blank 1	Total Kjeldahl Nitrogen	EPA 351.2	ND			mg/L

QCBatchID	QCType	Parameter	Method	Result	Actual	% Rec	Units
QC18110867	LCS 1	Orthophosphate, as P	SM 4500-P E	0.268	0.250	107	mg/L
QC18110868	LCS 1	Orthophosphate, as P	SM 4500-P E	0.269	0.250	107	mg/L
QC18110952	LCS 1	Total Suspended Solids (TSS)	SM 2540D	198	200	99	mg/L
QC18110952	LCS 2	Total Suspended Solids (TSS)	SM 2540D	200	200	100	mg/L
QC18110954	LCS 1	Total Suspended Solids (TSS)	SM 2540D	200	200	100	mg/L
QC18110954	LCS 2	Total Suspended Solids (TSS)	SM 2540D	200	200	100	mg/L
QC18110971	LCS 1	Total Phosphorous as P	SM 4500-P E	0.246	0.250	99	mg/L
QC18111018	LCS 1	Total Suspended Solids (TSS)	SM 2540D	197	200	99	mg/L
QC18111018	LCS 2	Total Suspended Solids (TSS)	SM 2540D	199	200	100	mg/L
QC18111021	LCS 1	Total Dissolved Solids (TDS)	SM 2540C	154	150	103	mg/L
QC18111021	LCS 2	Total Dissolved Solids (TDS)	SM 2540C	157	150	105	mg/L
QC18111025	LCS 1	Total Phosphorous as P	SM 4500-P E	0.275	0.250	110	mg/L
QC18111088	LCS 1	Total Dissolved Solids (TDS)	SM 2540C	155	150	103	mg/L
QC18111088	LCS 2	Total Dissolved Solids (TDS)	SM 2540C	137	150	91	mg/L
QC18111089	LCS 1	Total Dissolved Solids (TDS)	SM 2540C	137	150	91	mg/L
QC18111089	LCS 2	Total Dissolved Solids (TDS)	SM 2540C	137	150	91	mg/L
QC18111090	LCS 1	Total Kjeldahl Nitrogen	EPA 351.2	0.915	1.00	92	mg/L
QC18120046	LCS 1	Nitrate + Nitrite Nitrogen	EPA 353.2	0.784	0.800	98	mg/L
QC18120047	LCS 1	Nitrate + Nitrite Nitrogen	EPA 353.2	0.730	0.800	91	mg/L
QC18120139	LCS 1	Total Kjeldahl Nitrogen	EPA 351.2	0.965	1.00	96	mg/L

QCBatchID	QCType	Parameter	Method	Duplicate Sample	Sample Result	Duplicate Result	Units	RPD
QC18110952	Duplicate 1	Total Suspended Solids (TSS)	SM 2540D	18110627-00	28.0	30.5	mg/L	9 %
QC18110952	Duplicate 2	Total Suspended Solids (TSS)	SM 2540D	18110627-00	17.0	18.0	mg/L	6 %
QC18110954	Duplicate 1	Total Suspended Solids (TSS)	SM 2540D	18110644-00	40.0	38.0	mg/L	5 %
QC18110954	Duplicate 2	Total Suspended Solids (TSS)	SM 2540D	18110648-00	26.5	30.0	mg/L	12 %
QC18111018	Duplicate 1	Total Suspended Solids (TSS)	SM 2540D	18110635-01	28.5	28.5	mg/L	<1%
QC18111018	Duplicate 2	Total Suspended Solids (TSS)	SM 2540D	18110635-01	65.0	56.0	mg/L	15 %
QC18111021	Duplicate 1	Total Dissolved Solids (TDS)	SM 2540C	18110661-00	18110	17490	mg/L	3 %
QC18111021	Duplicate 2	Total Dissolved Solids (TDS)	SM 2540C	18110661-00	6128	6116	mg/L	<1%

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

QCBatchID	QCType	Parameter	Method	Duplicate Sample	Sample Result	Duplicate Result	Units	RPD
QC18111088	Duplicate 1	Total Dissolved Solids (TDS)	SM 2540C	18110664-00	1890	1882	mg/L	<1%
QC18111088	Duplicate 2	Total Dissolved Solids (TDS)	SM 2540C	18110664-00	1484	1442	mg/L	3 %
QC18111089	Duplicate 1	Total Dissolved Solids (TDS)	SM 2540C	18110664-00	954	998	mg/L	5 %

QCBatchID	QCType	Parameter	Method	Spike Sample	Sample Result		MS Result	MSD Result	Spike Value	Units	MS %Rec	MSD %Rec	RPD %
QC18110867	MS 1	Orthophosphate, as P	SM 4500-P E	18110633-001	0.064		0.318	0.330	0.25	mg/L	102	106	4
QC18110867	MS 2	Orthophosphate, as P	SM 4500-P E	18110635-003	0.312	HT	0.529	0.534	0.25	mg/L	87	89	<1
QC18110868	MS 1	Orthophosphate, as P	SM 4500-P E	18110635-017	0.032	HT	0.283	0.300	0.25	mg/L	100	107	6
QC18110971	MS 1	Total Phosphorous as P	SM 4500-P E	18110676-001	7.15		12.5	13.3	0.25	mg/L	108	122	6
QC18110971	MS 2	Total Phosphorous as P	SM 4500-P E	18110635-003	0.473		0.756	0.802	0.25	mg/L	113	132	6
QC18111025	MS 1	Total Phosphorous as P	SM 4500-P E	18110635-011	1.05	SC	2.71	2.77	0.25	mg/L	NC	NC	NC
QC18111025	MS 2	Total Phosphorous as P	SM 4500-P E	18110669-003	0.040		0.260	0.278	0.25	mg/L	88	96	7
QC18111090	MS 1	Total Kjeldahl Nitrogen	EPA 351.2	18110633-006	0.810	M	1.06	1.14	0.5	mg/L	NC	NC	NC
QC18111090	MS 2	Total Kjeldahl Nitrogen	EPA 351.2	18110635-008	6.23	SC	6.82	6.85	0.5	mg/L	NC	NC	NC
QC18120046	MS 1	Nitrate + Nitrite Nitrogen	EPA 353.2	18110253-007	1.73	M	7.48	7.20	1	mg/L	NC	NC	NC
QC18120046	MS 2	Nitrate + Nitrite Nitrogen	EPA 353.2	18110595-002	0.354		5.18	5.22	1	mg/L	96	97	<1
QC18120047	MS 1	Nitrate + Nitrite Nitrogen	EPA 353.2	18110635-006	0.702		1.69	1.68	1	mg/L	99	98	<1
QC18120047	MS 2	Nitrate + Nitrite Nitrogen	EPA 353.2	18110635-016	1.40		2.40	2.32	1	mg/L	100	92	3
QC18120139	MS 1	Total Kjeldahl Nitrogen	EPA 351.2	18110635-018	0.735	M	1.16	1.18	0.5	mg/L	NC	NC	NC
QC18120139	MS 2	Total Kjeldahl Nitrogen	EPA 351.2	18110706-006	0.350		0.820	0.805	0.5	mg/L	94	91	2

WETLAB
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WETLAB Order ID. 18110635
Sparks Control # ______
Elko Control # ______
LV Control # ______
Report Due Date
Page 1 of 3

Client Balance Hydrologics
Address 12020 Donner Pass Rd. Suite B1
City, State & Zip Truckee, CA 96161
Contact Brian Hastings
Phone 530-550-9776
Collector's Name BT
Fax
PWS/Project Name
P.O. Number
PWS/Project Number 213136
Email rboitano@balancehydro.com

Turnaround Time Requirements
Standard ☐
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48 Hour* (100%) ☐ 24 Hour* (200%) ☐
*Surcharges Will Apply

Samples Collected From Which State?
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Other ☐

Report Results Via
PDF ☐ EDD ☐
Other ______

Compliance Monitoring?
Yes ☐ No ☐

Report to Regulatory Agency?
Yes ☐ No ☐

Standard QC Required?
Yes ☐ No ☐

Billing Address (if different than Client Address)
Company Balance Hydrologics
Address 800 Bancroft Way Suite 101
City, State & Zip Berkeley, CA 94710
Contact Rachel Boitano
Phone 510-704-1000 Fax ______
Email rboitano@balancehydro.com

SAMPLE ID/LOCATION	DATE	TIME	PRES TYPE *	SAMPLE TYPE **	NO. OF CONTAINERS	Total N	Total P	* Nitrate	Ortho P	TDS	TSS					Spl. No.
C-24 (1)	11/21/18	20:01		aq	2	✓	✓	✓	✓	✓	✓					1
C-24 (2)	11/21/18	21:02		aq	2	✓	✓	✓	✓	✓	✓					2
C-24 (3)	11/21/18	22:38		aq	2	✓	✓	✓	✓	✓	✓					3
C-24 (4)	11/22/18	03:17		aq	2	✓	✓	✓	✓	✓	✓					4
H-19 (1)	11/21/18	20:00		aq	2	✓	✓	✓	✓	✓	✓					5
H-19 (2)	11/22/18	04:49		aq	2	✓	✓	✓	✓	✓	✓					6
H-19 (3)	11/22/18	05:18		aq	2	✓	✓	✓	✓	✓	✓					7
H-19 (4)	11/22/18	05:27		aq	2	✓	✓	✓	✓	✓	✓					8

Instructions/Comments/Special Requirements: *changed to LACHAT due to hold time per client request when relinquished MM 11/26/18

1811 2
0635 18

Sample Matrix Key** DW = Drinking Water WW = Wastewater SW = Surface Water MW = Monitoring Well SD = Solid/Sludge SO = Soil HW = Hazardous Waste OTHER: ______

***SAMPLE PRESERVATIVES:** 1=Unpreserved 2=H2SO4 3=NaOH 4=HCl 5=HNO3 6=Na2S2O3 7=ZnOAc+NaOH 8=HCl/VOA Vial

Temp	Custody Seal	# of Containers	DATE	TIME	Samples Relinquished By	Samples Received By
2.4 °C	Y N [✓ None]	36	11/26/18	1040		
°C	Y N None					
°C	Y N None					
°C	Y N None					

WETLAB'S Standard Terms and Conditions apply unless written agreements specify otherwise. Payment terms are Net 30.

Client/Collector attests to the validity and authenticity of this (these) sample(s) and, is (are) aware that tampering with or intentionally mislabeling the sample(s) location, date or time of collection may be considered fraud and subject to legal action (NAC445.0636). ______ initial

To the maximum extent permitted by law, the Client agrees to limit the liability of WETLAB for the Client's damages to the total compensation received, unless other agreements are made in writing. This limitation shall apply regardless of the cause of action or legal theory pled or asserted. ______ initial

WETLAB will dispose of samples 90 days from sample receipt. Client may request a longer sample storage time for an additional fee. Please contact your Project Manager for details. ______ initial

301.2E

WETLAB
WESTERN ENVIRONMENTAL TESTING LABORATORY
Specializing in Soil, Hazardous Waste and Water Analysis.
475 E. Greg Street #119 | Sparks, Nevada 89431 | www.WETLaboratory.com
tel (775) 355-0202 | fax (775) 355-0817
1084 Lamoille Highway | Elko, Nevada 89801
tel (775) 777-9933 | fax (775) 777-9933
3230 Polaris Ave., Suite 4 | Las Vegas, Nevada 89102
tel (702) 475-8899 | fax (702) 776-6152

WETLAB Order ID. 18110635
Sparks Control # ____
Elko Control # ____
LV Control # ____
Report Due Date
Page 2 of 3

Client Balance Hydrologics
Address 12020 Donner Pass Rd. Suite B1
City, State & Zip Truckee, CA 96161
Contact Brian Hastings
Phone 530-550-9776
Collector's Name BT
Fax
PWS/Project Name
P.O. Number
PWS/Project Number 213136
Email rboitano@balancehydro.com

Turnaround Time Requirements
Standard ☐
5 Day* (25%) ☐ 72 Hour* (50%) ☐
48 Hour* (100%) ☐ 24 Hour* (200%) ☐
*Surcharges Will Apply

Samples Collected From Which State?
NV ☐ CA ☐ Other ☐

Report Results Via
PDF ☐ EDD ☐
Other ____

Compliance Monitoring?
Yes ☐ No ☐

Report to Regulatory Agency?
Yes ☐ No ☐

Standard QC Required?
Yes ☐ No ☐

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Company Balance Hydrologics
Address 800 Bancroft Way Suite 101
City, State & Zip Berkeley, CA 94710
Contact Rachel Boitano
Phone 510-704-1000 Fax ____
Email rboitano@balancehydro.com

Analyses Requested

SAMPLE ID/LOCATION	DATE	TIME	PRES TYPE *	SAMPLE TYPE **	NO. OF CONTAINERS	Total N	Total P	Nitrate	Ortho P	TDS	TSS					Spl. No.
D-16 (1)	11/21/18	22:20		aq	2	✓	✓	✓	✓	✓	✓					9
D-16 (2)	11/22/18	05:30		aq	2	✓	✓	✓	✓	✓	✓					10
D-16 (3)	11/22/18	05:57		aq	2	✓	✓	✓	✓	✓	✓					11
D-16 (4)	11/22/18	06:10		aq	2	✓	✓	✓	✓	✓	✓					12
SDOE008936(1)	11/21/18	21:24		aq	2	✓	✓	✓	✓	✓	✓					13
SDOE008936(4)	11/22/18	11:01		aq	2	✓	✓	✓	✓	✓	✓					14
YD@SBC (1)	11/22/18	08:36		aq	2	✓	✓		✓	✓	✓					15
YD@SBC (2)	11/22/18	09:16		aq	2	✓	✓		✓	✓	✓					16
YD@SBC (3)	11/22/18	11:36		aq	2	✓	✓		✓	✓	✓					17

Instructions/Comments/Special Requirements:

1811 2
0635 18

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Temp	Custody Seal	# of Containers	DATE	TIME	Samples Relinquished By	Samples Received By
2.4 °C	Y N [✓ None]		11/26/18	1040		
°C	Y N None					
°C	Y N None					
°C	Y N None					

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WETLAB Order ID. 18110635
Sparks Control # ____
Elko Control # ____
LV Control # ____
Report Due Date
Page 3 of 3

Client Balance Hydrologics
Address 12020 Donner Pass Rd. Suite B1
City, State & Zip Truckee, CA 96161
Contact Brian Hastings
Phone 530-550-9776
Collector's Name BT
Fax
PWS/Project Name
P.O. Number
PWS/Project Number 213136
Email rboitano@balancehydro.com

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Standard ☐
5 Day* (25%) ☐ 72 Hour* (50%) ☐
48 Hour* (100%) ☐ 24 Hour* (200%) ☐
*Surcharges Will Apply

Samples Collected From Which State?
NV ☐ CA ☐ Other ☐

Compliance Monitoring?
Yes ☐ No ☐

Report to Regulatory Agency?
Yes ☐ No ☐

Report Results Via
PDF ☐ EDD ☐
Other ____

Standard QC Required?
Yes ☐ No ☐

Billing Address (if different than Client Address)
Company Balance Hydrologics
Address 800 Bancroft Way Suite 101
City, State & Zip Berkeley, CA 94710
Contact Rachel Boitano
Phone 510-704-1000 Fax ____
Email rboitano@balancehydro.com

Analyses Requested

SAMPLE ID/LOCATION	DATE	TIME	PRES TYPE *	SAMPLE TYPE **	NO. OF CONTAINERS	Total N	Total P	* Nitrate	Ortho P	TDS	TSS						Spl. No.
YD@SBC (4)	11/22/18	12:45		aq	2	✓	✓		✓	✓	✓						18

1811 2
0635 18

Instructions/Comments/Special Requirements:

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Temp	Custody Seal	# of Containers	DATE	TIME	Samples Relinquished By	Samples Received By
2.4 °C	Y N [✓ None]		11/26/18	1040		
°C	Y N None					
°C	Y N None					
°C	Y N None					

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301.2E

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TESTING LABORATORY

www.WETLaboratory.com

Specializing in Soil, Hazardous Waste and Water Analysis

1/29/2019

Balance Hydrologics
800 Baucroft Ave. Suite 101
Berkeley, CA 94710
Attn: Brian Hastings

OrderID: *19010465*

Dear: Brian Hastings

This is to transmit the attached analytical report. The analytical data and information contained therein was generated using specified or selected methods contained in references, such as Standard Methods for the Examination of Water and Wastewater, online edition, Methods for Determination of Organic Compounds in Drinking Water, EPA-600/4-79-020, and Test Methods for Evaluation of Solid Waste, Physical/Chemical Methods (SW846) Third Edition.

The samples were received by WETLAB-Western Environmental Testing Laboratory in good condition on 1/16/2019. Additional comments are located on page 2 of this report.

If you should have any questions or comments regarding this report, please do not hesitate to call.

Sincerely,

A Smith

Andy Smith
QA Manager

Western Environmental Testing Laboratory
Report Comments

Balance Hydrologics - 19010465

Specific Report Comments

None

Report Legend

B -- Blank contamination; Analyte detected above the method reporting limit in an associated blank

D -- Due to the sample matrix dilution was required in order to properly detect and report the analyte. The reporting limit has been adjusted accordingly.

HT -- Sample analyzed beyond the accepted holding time

J -- The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit

M -- The matrix spike/matrix spike duplicate (MS/MSD) values for the analysis of this parameter were outside acceptance criteria due to probable matrix interference. The reported result should be considered an estimate.

N -- There was insufficient sample available to perform a spike and/or duplicate on this analytical batch.

NC -- Not calculated due to matrix interference

QD -- The sample duplicate or matrix spike duplicate analysis demonstrated sample imprecision. The reported result should be considered an estimate.

QL -- The result for the laboratory control sample (LCS) was outside WETLAB acceptance criteria and reanalysis was not possible. The reported data should be considered an estimate.

S -- Surrogate recovery was outside of laboratory acceptance limits due to matrix interference. The associated blank and LCS surrogate recovery was within acceptance limits

SC -- Spike recovery not calculated. Sample concentration >4X the spike amount; therefore, the spike could not be adequately recovered

U -- The analyte was analyzed for, but was not detected above the level of the reported sample reporting/quantitation limit

General Lab Comments

Per method recommendation (section 4.4), Samples analyzed by methods EPA 300.0 and EPA 300.1 have been filtered prior to analysis.

The following is an interpretation of the results from EPA method 9223B:
A result of zero (0) indicates absence for both coliform and Escherichia coli meaning the water meets the microbiological requirements of the U.S. EPA Safe Drinking Water Act (SDWA). A result of one (1) for either test indicates presence and the water does not meet the SDWA requirements. Waters with positive tests should be disinfected by a certified water treatment operator and retested.

Per federal regulation the holding time for the following parameters in aqueous/water samples is 15 minutes: Residual Chlorine, pH, Dissolved Oxygen, Sulfite.

Western Environmental Testing Laboratory
Analytical Report

Balance Hydrologics
800 Baucroft Ave. Suite 101
Berkeley, CA 94710
Attn: Brian Hastings
Phone: (510-704-1000 **Fax:**

Date Printed: 1/29/2019
OrderID: *19010465*

Customer Sample ID: H-19 (1)
WETLAB Sample ID: 19010465-001

Collect Date/Time: 1/16/2019 10:35
Receive Date: 1/16/2019 13:20

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Orthophosphate, as P	SM 4500-P E	0.13		mg/L	1	0.010	1/16/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.51		mg/L	5	0.050	1/17/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	120		mg/L	1	1.0	1/17/2019	NV00925
Total Nitrogen	Calc.	1.7		mg/L	1	0.24	1/22/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	480		mg/L	1	10	1/17/2019	NV00925
Microbiological Analyses								
Total Coliform (MPN)	SM 9223B (Quantitray)	>2419.6		MPN/100ml	1	1.0	1/16/2019	NV00925
Escherichia Coli (MPN)	SM 9223B (Quantitray)	90.8	QD	MPN/100ml	1	1.0	1/16/2019	NV00925
Anions by Ion Chromatography								
Nitrate Nitrogen	EPA 300.0	0.24		mg/L	2	0.020	1/17/2019	NV00925
Nitrite Nitrogen	EPA 300.0	0.047		mg/L	2	0.020	1/17/2019	NV00925
Flow Injection Analyses								
Total Kjeldahl Nitrogen	EPA 351.2	1.5		mg/L	0.5	0.20	1/22/2019	NV00925

Customer Sample ID: D-16 (1)
WETLAB Sample ID: 19010465-002

Collect Date/Time: 1/16/2019 11:26
Receive Date: 1/16/2019 13:20

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Orthophosphate, as P	SM 4500-P E	0.14		mg/L	1	0.010	1/16/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.49		mg/L	5	0.050	1/17/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	180		mg/L	1	1.0	1/17/2019	NV00925
Total Nitrogen	Calc.	2.3		mg/L	1	0.24	1/22/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	470	QD	mg/L	1	10	1/17/2019	NV00925
Microbiological Analyses								
Total Coliform (MPN)	SM 9223B (Quantitray)	>2419.6		MPN/100ml	1	1.0	1/16/2019	NV00925
Escherichia Coli (MPN)	SM 9223B (Quantitray)	280.9		MPN/100ml	1	1.0	1/16/2019	NV00925
Anions by Ion Chromatography								
Nitrate Nitrogen	EPA 300.0	0.37		mg/L	2	0.020	1/17/2019	NV00925
Nitrite Nitrogen	EPA 300.0	0.062		mg/L	2	0.020	1/17/2019	NV00925
Flow Injection Analyses								
Total Kjeldahl Nitrogen	EPA 351.2	1.9		mg/L	0.5	0.20	1/22/2019	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Customer Sample ID: SDOE008936 (1) **Collect Date/Time:** 1/16/2019 12:55

WETLAB Sample ID: 19010465-003 **Receive Date:** 1/16/2019 13:20

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.12	mg/L	1	0.010	1/16/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.35	mg/L	5	0.050	1/17/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	110	mg/L	1	1.0	1/17/2019	NV00925
Total Nitrogen	Calc.	1.7	mg/L	1	0.24	1/22/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	130	mg/L	1	10	1/17/2019	NV00925
Microbiological Analyses							
Total Coliform (MPN)	SM 9223B (Quantitray)	>2419.6	MPN/100ml	1	1.0	1/16/2019	NV00925
Escherichia Coli (MPN)	SM 9223B (Quantitray)	410.6 QD	MPN/100ml	1	1.0	1/16/2019	NV00925
Anions by Ion Chromatography							
Nitrate Nitrogen	EPA 300.0	0.30	mg/L	2	0.020	1/17/2019	NV00925
Nitrite Nitrogen	EPA 300.0	0.060	mg/L	2	0.020	1/17/2019	NV00925
Flow Injection Analyses							
Total Kjeldahl Nitrogen	EPA 351.2	1.4	mg/L	0.5	0.20	1/22/2019	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Western Environmental Testing Laboratory
QC Report

QCBatchID	QCType	Parameter	Method	Result	Actual	% Rec	Units
QC19010512	Blank 1	Orthophosphate, as P	SM 4500-P E	ND			mg/L
QC19010550	Blank 1	Total Phosphorous as P	SM 4500-P E	ND			mg/L
QC19010559	Blank 1	Total Coliform (MPN)	SM 9223B (Qu	ND			MPN/100ml
		Escherichia Coli (MPN)	SM 9223B (Qu	ND			MPN/100ml
QC19010584	Blank 1	Nitrate Nitrogen	EPA 300.0	ND			mg/L
		Nitrite Nitrogen	EPA 300.0	ND			mg/L
QC19010591	Blank 1	Total Suspended Solids (TSS)	SM 2540D	ND			mg/L
QC19010648	Blank 1	Total Dissolved Solids (TDS)	SM 2540C	ND			mg/L
QC19010686	Blank 1	Total Kjeldahl Nitrogen	EPA 351.2	ND			mg/L

QCBatchID	QCType	Parameter	Method	Result	Actual	% Rec	Units
QC19010512	LCS 1	Orthophosphate, as P	SM 4500-P E	0.253	0.250	101	mg/L
QC19010550	LCS 1	Total Phosphorous as P	SM 4500-P E	0.269	0.250	107	mg/L
QC19010584	LCS 1	Nitrate Nitrogen	EPA 300.0	0.467	0.500	93	mg/L
		Nitrite Nitrogen	EPA 300.0	0.483	0.500	97	mg/L
QC19010591	LCS 1	Total Suspended Solids (TSS)	SM 2540D	199	200	99	mg/L
QC19010591	LCS 2	Total Suspended Solids (TSS)	SM 2540D	200	200	100	mg/L
QC19010648	LCS 1	Total Dissolved Solids (TDS)	SM 2540C	140	150	93	mg/L
QC19010648	LCS 2	Total Dissolved Solids (TDS)	SM 2540C	140	150	93	mg/L
QC19010686	LCS 1	Total Kjeldahl Nitrogen	EPA 351.2	1.08	1.00	108	mg/L

QCBatchID	QCType	Parameter	Method	Duplicate Sample	Sample Result	Duplicate Result		Units	RPD
QC19010559	Duplicate 1	Total Coliform (MPN)	SM 9223B (Quanti	19010465-00	>2419.6	>2419.6		MPN/100ml	NA
		Escherichia Coli (MPN)	SM 9223B (Quanti	19010465-00	90.8	138	QD	MPN/100ml	41 %
QC19010559	Duplicate 2	Total Coliform (MPN)	SM 9223B (Quanti	19010465-00	>2419.6	>2419.6		MPN/100ml	NA
		Escherichia Coli (MPN)	SM 9223B (Quanti	19010465-00	281	240		MPN/100ml	16 %
QC19010559	Duplicate 3	Total Coliform (MPN)	SM 9223B (Quanti	19010465-00	>2419.6	>2419.6		MPN/100ml	NA
		Escherichia Coli (MPN)	SM 9223B (Quanti	19010465-00	411	613	QD	MPN/100ml	40 %
QC19010591	Duplicate 1	Total Suspended Solids (TSS)	SM 2540D	19010454-00	ND	ND		mg/L	<1%
QC19010591	Duplicate 2	Total Suspended Solids (TSS)	SM 2540D	19010454-00	ND	ND		mg/L	<1%
QC19010648	Duplicate 1	Total Dissolved Solids (TDS)	SM 2540C	19010465-00	478	465		mg/L	3 %
QC19010648	Duplicate 2	Total Dissolved Solids (TDS)	SM 2540C	19010465-00	466	437	QD	mg/L	6 %

QCBatchID	QCType	Parameter	Method	Spike Sample	Sample Result		MS Result	MSD Result	Spike Value	Units	MS %Rec	MSD %Rec	RPD %
QC19010512	MS 1	Orthophosphate, as P	SM 4500-P E	19010465-001	0.130		0.379	0.392	0.25	mg/L	100	105	3
QC19010550	MS 1	Total Phosphorous as P	SM 4500-P E	19010494-001	0.171		0.416	0.418	0.25	mg/L	98	99	<1
QC19010550	MS 2	Total Phosphorous as P	SM 4500-P E	19010494-002	0.232	M	0.613	0.614	0.25	mg/L	NC	NC	NC
QC19010584	MS 1	Nitrate Nitrogen	EPA 300.0	19010475-001	0.126		0.620	0.622	0.5	mg/L	99	99	<1
		Nitrite Nitrogen	EPA 300.0	19010475-001	ND	M	0.092	0.083	0.125	mg/L	NC	NC	NC
QC19010686	MS 1	Total Kjeldahl Nitrogen	EPA 351.2	19010494-001	0.695		1.14	1.12	0.5	mg/L	90	85	2
QC19010686	MS 2	Total Kjeldahl Nitrogen	EPA 351.2	19010528-001	1.14		1.64	1.72	0.5	mg/L	99	116	5

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WETLAB Order ID. 19010465
Sparks Control #
Elko Control #
LV Control #
Report Due Date
Page 1 of 1

Client Balance Hydrologics
Address 12020 Donner Pass Rd
City, State & Zip
Contact
Phone
Collector's Name
Fax
PWS/Project Name
P.O. Number
PWS/Project Number
Email

Turnaround Time Requirements

Standard ____
5 Day* (25%) ____ 72 Hour* (50%) ____
48 Hour* (100%) ____ 24 Hour* (200%) ____
*Surcharges Will Apply

Samples Collected From Which State?
NV____ CA____
Other____

Compliance Monitoring?
Yes No

Report Results Via
PDF EDD
Other ____

Report to Regulatory Agency?
Yes No

Standard QC Required?
Yes No

Billing Address (if different than Client Address)

Company on file
Address
City, State & Zip
Contact
Phone ____ Fax ____
Email

Analyses Requested

SAMPLE ID/LOCATION	DATE	TIME	PRES TYPE *	SAMPLE TYPE **	NO. OF CONTAINERS	Total N	Total P	Ortho P	NO3	TSS	TDS	E coli				Spl. No.
H-19 (1)	1/16/19	10:35		Ag	4	X	X	X	X	X	X	X				
D-16 (1)	1/16/19	11:26		Ag	4	X	X	X	X	X	X	X				
SDOE 008936 (1)	1/16/19	12:55		Ag	4	X	X	X	X	X	X	X				

1901 6
0465 3

Instructions/Comments/Special Requirements:

Sample Matrix Key** DW = Drinking Water WW = Wastewater SW = Surface Water MW = Monitoring Well SD = Solid/Sludge SO = Soil HW = Hazardous Waste OTHER: ____

***SAMPLE PRESERVATIVES:** 1=Unpreserved 2=H2SO4 3=NaOH 4=HCl 5=HNO3 6=Na2S2O3 7=ZnOAc+NaOH 8=HCl/VOA Vial

Temp	Custody Seal	# of Containers	DATE	TIME	Samples Relinquished By	Samples Received By
4.9 °C	Y N [✓ None]	12	1/16/19	1320		
°C	Y N None					
°C	Y N None					
°C	Y N None					

WETLAB'S Standard Terms and Conditions apply unless written agreements specify otherwise. Payment terms are Net 30.

Client/Collector attests to the validity and authenticity of this (these) sample(s) and, is (are) aware that tampering with or intentionally mislabeling the sample(s) location, date or time of collection may be considered fraud and subject to legal action (NAC445.0636). ________ initial

To the maximum extent permitted by law, the Client agrees to limit the liability of WETLAB for the Client's damages to the total compensation received, unless other agreements are made in writing. This limitation shall apply regardless of the cause of action or legal theory pled or asserted. ________ initial

WETLAB will dispose of samples 90 days from sample receipt. Client may request a longer sample storage time for an additional fee. Please contact your Project Manager for details. ________ initial

301.2E

WETLAB
WESTERN ENVIRONMENTAL TESTING LABORATORY

www.WETLaboratory.com

Specializing in Soil, Hazardous Waste and Water Analysis

1/29/2019

Balance Hydrologics
800 Baucroft Ave. Suite 101
Berkeley, CA 94710
Attn: Brian Hastings

OrderID: *19010494*

Dear: Brian Hastings

This is to transmit the attached analytical report. The analytical data and information contained therein was generated using specified or selected methods contained in references, such as Standard Methods for the Examination of Water and Wastewater, online edition, Methods for Determination of Organic Compounds in Drinking Water, EPA-600/4-79-020, and Test Methods for Evaluation of Solid Waste, Physical/Chemical Methods (SW846) Third Edition.

The samples were received by WETLAB-Western Environmental Testing Laboratory in good condition on 1/16/2019. Additional comments are located on page 2 of this report.

If you should have any questions or comments regarding this report, please do not hesitate to call.

Sincerely,

Andy Smith
QA Manager

Western Environmental Testing Laboratory
Report Comments

Balance Hydrologics - 19010494

Specific Report Comments

None

Report Legend

B	--	Blank contamination; Analyte detected above the method reporting limit in an associated blank
D	--	Due to the sample matrix dilution was required in order to properly detect and report the analyte. The reporting limit has been adjusted accordingly.
HT	--	Sample analyzed beyond the accepted holding time
J	--	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit
M	--	The matrix spike/matrix spike duplicate (MS/MSD) values for the analysis of this parameter were outside acceptance criteria due to probable matrix interference. The reported result should be considered an estimate.
N	--	There was insufficient sample available to perform a spike and/or duplicate on this analytical batch.
NC	--	Not calculated due to matrix interference
QD	--	The sample duplicate or matrix spike duplicate analysis demonstrated sample imprecision. The reported result should be considered an estimate.
QL	--	The result for the laboratory control sample (LCS) was outside WETLAB acceptance criteria and reanalysis was not possible. The reported data should be considered an estimate.
S	--	Surrogate recovery was outside of laboratory acceptance limits due to matrix interference. The associated blank and LCS surrogate recovery was within acceptance limits
SC	--	Spike recovery not calculated. Sample concentration >4X the spike amount; therefore, the spike could not be adequately recovered
U	--	The analyte was analyzed for, but was not detected above the level of the reported sample reporting/quantitation limit

General Lab Comments

Per method recommendation (section 4.4), Samples analyzed by methods EPA 300.0 and EPA 300.1 have been filtered prior to analysis.

The following is an interpretation of the results from EPA method 9223B:
A result of zero (0) indicates absence for both coliform and Escherichia coli meaning the water meets the microbiological requirements of the U.S. EPA Safe Drinking Water Act (SDWA). A result of one (1) for either test indicates presence and the water does not meet the SDWA requirements. Waters with positive tests should be disinfected by a certified water treatment operator and retested.

Per federal regulation the holding time for the following parameters in aqueous/water samples is 15 minutes: Residual Chlorine, pH, Dissolved Oxygen, Sulfite.

Western Environmental Testing Laboratory
Analytical Report

Balance Hydrologics
800 Baucroft Ave. Suite 101
Berkeley, CA 94710
Attn: Brian Hastings
Phone: (510-704-1000 **Fax:**

Date Printed: 1/29/2019
OrderID: *19010494*

Customer Sample ID: BS@SBC (1) **Collect Date/Time:** 1/16/2019 14:00
WETLAB Sample ID: 19010494-001 **Receive Date:** 1/16/2019 17:00

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Orthophosphate, as P	SM 4500-P E	0.10		mg/L	1	0.010	1/17/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.17		mg/L	1	0.010	1/17/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	26		mg/L	1	1.0	1/17/2019	NV00925
Total Nitrogen	Calc.	1.7		mg/L	1	0.22	1/22/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	250		mg/L	1	10	1/17/2019	NV00925
Flow Injection Analyses								
Nitrate + Nitrite Nitrogen	EPA 353.2	1.0		mg/L	1	0.020	1/19/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.70		mg/L	0.5	0.20	1/22/2019	NV00925

Customer Sample ID: YD@SBC(1) **Collect Date/Time:** 1/16/2019 15:15
WETLAB Sample ID: 19010494-002 **Receive Date:** 1/16/2019 17:00

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Orthophosphate, as P	SM 4500-P E	0.13		mg/L	1	0.010	1/17/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.23	M	mg/L	1	0.010	1/17/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	50		mg/L	1	1.0	1/17/2019	NV00925
Total Nitrogen	Calc.	2.7		mg/L	1	0.22	1/22/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	230		mg/L	1	10	1/17/2019	NV00925
Flow Injection Analyses								
Nitrate + Nitrite Nitrogen	EPA 353.2	1.6		mg/L	1	0.020	1/19/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	1.0		mg/L	0.5	0.20	1/22/2019	NV00925

Customer Sample ID: SBC@CWW(1) **Collect Date/Time:** 1/16/2019 16:00
WETLAB Sample ID: 19010494-003 **Receive Date:** 1/16/2019 17:00

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.11	mg/L	1	0.010	1/17/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.21	mg/L	1	0.010	1/17/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	68	mg/L	1	1.0	1/17/2019	NV00925
Total Nitrogen	Calc.	1.7	mg/L	1	0.22	1/22/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	360	mg/L	1	10	1/17/2019	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Customer Sample ID: SBC@CWW(1) **Collect Date/Time:** 1/16/2019 16:00

WETLAB Sample ID: 19010494-003 **Receive Date:** 1/16/2019 17:00

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	0.83	mg/L	1	0.020	1/19/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.92	mg/L	0.5	0.20	1/22/2019	NV00925

Customer Sample ID: NTD@BFD(1) **Collect Date/Time:** 1/16/2019 16:40

WETLAB Sample ID: 19010494-004 **Receive Date:** 1/16/2019 17:00

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.11	mg/L	1	0.010	1/17/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.15	mg/L	1	0.010	1/17/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	47	mg/L	1	1.0	1/17/2019	NV00925
Total Nitrogen	Calc.	3.0	mg/L	1	0.22	1/22/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	300	mg/L	1	10	1/17/2019	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	0.60	mg/L	1	0.020	1/19/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	2.4	mg/L	0.5	0.20	1/22/2019	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Western Environmental Testing Laboratory
QC Report

QCBatchID	QCType	Parameter	Method	Result	Actual	% Rec	Units
QC19010550	Blank 1	Total Phosphorous as P	SM 4500-P E	ND			mg/L
QC19010555	Blank 1	Orthophosphate, as P	SM 4500-P E	ND			mg/L
QC19010591	Blank 1	Total Suspended Solids (TSS)	SM 2540D	ND			mg/L
QC19010643	Blank 1	Nitrate + Nitrite Nitrogen	EPA 353.2	ND			mg/L
QC19010648	Blank 1	Total Dissolved Solids (TDS)	SM 2540C	ND			mg/L
QC19010686	Blank 1	Total Kjeldahl Nitrogen	EPA 351.2	ND			mg/L

QCBatchID	QCType	Parameter	Method	Result	Actual	% Rec	Units
QC19010550	LCS 1	Total Phosphorous as P	SM 4500-P E	0.269	0.250	107	mg/L
QC19010555	LCS 1	Orthophosphate, as P	SM 4500-P E	0.256	0.250	102	mg/L
QC19010591	LCS 1	Total Suspended Solids (TSS)	SM 2540D	199	200	99	mg/L
QC19010591	LCS 2	Total Suspended Solids (TSS)	SM 2540D	200	200	100	mg/L
QC19010643	LCS 1	Nitrate + Nitrite Nitrogen	EPA 353.2	0.796	0.800	99	mg/L
QC19010648	LCS 1	Total Dissolved Solids (TDS)	SM 2540C	140	150	93	mg/L
QC19010648	LCS 2	Total Dissolved Solids (TDS)	SM 2540C	140	150	93	mg/L
QC19010686	LCS 1	Total Kjeldahl Nitrogen	EPA 351.2	1.08	1.00	108	mg/L

QCBatchID	QCType	Parameter	Method	Duplicate Sample	Sample Result	Duplicate Result		Units	RPD
QC19010591	Duplicate 1	Total Suspended Solids (TSS)	SM 2540D	19010454-00	ND	ND		mg/L	<1%
QC19010591	Duplicate 2	Total Suspended Solids (TSS)	SM 2540D	19010454-00	ND	ND		mg/L	<1%
QC19010648	Duplicate 1	Total Dissolved Solids (TDS)	SM 2540C	19010465-00	478	465		mg/L	3 %
QC19010648	Duplicate 2	Total Dissolved Solids (TDS)	SM 2540C	19010465-00	466	437	QD	mg/L	6 %

QCBatchID	QCType	Parameter	Method	Spike Sample	Sample Result		MS Result	MSD Result	Spike Value	Units	MS %Rec	MSD %Rec	RPD %
QC19010550	MS 1	Total Phosphorous as P	SM 4500-P E	19010494-001	0.171		0.416	0.418	0.25	mg/L	98	99	<1
QC19010550	MS 2	Total Phosphorous as P	SM 4500-P E	19010494-002	0.232	M	0.613	0.614	0.25	mg/L	NC	NC	NC
QC19010555	MS 1	Orthophosphate, as P	SM 4500-P E	19010494-001	0.102		0.352	0.357	0.25	mg/L	100	102	1
QC19010643	MS 1	Nitrate + Nitrite Nitrogen	EPA 353.2	19010481-001	ND		5.11	5.19	1	mg/L	100	102	2
QC19010643	MS 2	Nitrate + Nitrite Nitrogen	EPA 353.2	19010510-001	0.576		5.68	5.69	1	mg/L	102	102	<1
QC19010686	MS 1	Total Kjeldahl Nitrogen	EPA 351.2	19010494-001	0.695		1.14	1.12	0.5	mg/L	90	85	2
QC19010686	MS 2	Total Kjeldahl Nitrogen	EPA 351.2	19010528-001	1.14		1.64	1.72	0.5	mg/L	99	116	5

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

WETLAB
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475 E. Greg Street #119 | Sparks, Nevada 89431 | www.WETLaboratory.com
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tel (775) 777-9933 | fax (775) 777-9933
3230 Polaris Ave., Suite 4 | Las Vegas, Nevada 89102
tel (702) 475-8899 | fax (702) 776-6152

WETLAB Order ID. 1901049 4
Sparks Control #
Elko Control #
LV Control #
Report Due Date
Page 1 of 1

Client Balance Hydrologics
Address on File
City, State & Zip
Contact
Phone
Collector's Name
Fax
PWS/Project Name
P.O. Number
PWS/Project Number
Email

Turnaround Time Requirements
Standard ✓
5 Day* (25%)
72 Hour* (50%)
48 Hour* (100%)
24 Hour* (200%)
*Surcharges Will Apply

Samples Collected From Which State?
NV ✓ CA Other

Compliance Monitoring?
[✓ Yes] No

Report to Regulatory Agency?
Yes [✓ No]

Report Results Via
[✓ PDF] EDD
Other

Standard QC Required?
[✓ Yes] No

Billing Address (if different than Client Address)
Company
Address
City, State & Zip
Contact
Phone
Fax
Email

SAMPLE ID/LOCATION	DATE	TIME	PRES TYPE *	SAMPLE TYPE **	NO. OF CONTAINERS	Total N	Total P	Ortho P	TSS	TDS						Spl. No.
BS @ SBC (1)	1/16/19	14:00		Aq	2	X	X	X	X	X						
YD @ SBC (1)	|	15:15		|	2	X	X	X	X	X						
SBC @ CWW (1)	|	16:00		|	2	X	X	X	X	X						
NTD @ BFD (1)	|	16:40		|	2	X	X	X	X	X						

1901 2
0494 4

Instructions/Comments/Special Requirements:

Sample Matrix Key** DW = Drinking Water WW = Wastewater SW = Surface Water MW = Monitoring Well SD = Solid/Sludge SO = Soil HW = Hazardous Waste OTHER:

***SAMPLE PRESERVATIVES:** 1=Unpreserved 2=H2SO4 3=NaOH 4=HCl 5=HNO3 6=Na2S2O3 7=ZnOAc+NaOH 8=HCl/VOA Vial

Temp	Custody Seal	# of Containers	DATE	TIME	Samples Relinquished By	Samples Received By
7.5 °C	Y N [✓ None]	8	1/16/19	1700		
°C	Y N None					
°C	Y N None					
°C	Y N None					

WETLAB'S Standard Terms and Conditions apply unless written agreements specify otherwise. Payment terms are Net 30.

Client/Collector attests to the validity and authenticity of this (these) sample(s) and, is (are) aware that tampering with or intentionally mislabeling the sample(s) location, date or time of collection may be considered fraud and subject to legal action (NAC445.0636). ________ initial

To the maximum extent permitted by law, the Client agrees to limit the liability of WETLAB for the Client's damages to the total compensation received, unless other agreements are made in writing. This limitation shall apply regardless of the cause of action or legal theory pled or asserted. ________ initial

WETLAB will dispose of samples 90 days from sample receipt. Client may request a longer sample storage time for an additional fee. Please contact your Project Manager for details. ________ initial

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TESTING LABORATORY

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Specializing in Soil, Hazardous Waste and Water Analysis

1/31/2019

Balance Hydrologics
800 Baucroft Ave. Suite 101
Berkeley, CA 94710
Attn: Brian Hastings

OrderID: *19010528*

Dear: Brian Hastings

This is to transmit the attached analytical report. The analytical data and information contained therein was generated using specified or selected methods contained in references, such as Standard Methods for the Examination of Water and Wastewater, online edition, Methods for Determination of Organic Compounds in Drinking Water, EPA-600/4-79-020, and Test Methods for Evaluation of Solid Waste, Physical/Chemical Methods (SW846) Third Edition.

The samples were received by WETLAB-Western Environmental Testing Laboratory in good condition on 1/17/2019. Additional comments are located on page 2 of this report.

If you should have any questions or comments regarding this report, please do not hesitate to call.

Sincerely,

Jennifer Delaney
QA Specialist

Western Environmental Testing Laboratory
Report Comments

Balance Hydrologics - 19010528

Specific Report Comments

The results for Orthophosphate on samples 19010528-001, 002, 009, 014, 019, and 020 are higher than expected, especially when compared to Total Phosphorus results. It is thought that particulate matter contained in the samples interfered with the Orthophosphate results by deflecting the light used in the spectrophotometric method. The particulate matter did not interfere with the Total Phosphorus analysis since that procedure includes an acid digestion process. Also reanalysis has been performed and confirming results have been obtained for Total Phosphorus.

Report Legend

B -- Blank contamination; Analyte detected above the method reporting limit in an associated blank

D -- Due to the sample matrix dilution was required in order to properly detect and report the analyte. The reporting limit has been adjusted accordingly.

HT -- Sample analyzed beyond the accepted holding time

J -- The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit

M -- The matrix spike/matrix spike duplicate (MS/MSD) values for the analysis of this parameter were outside acceptance criteria due to probable matrix interference. The reported result should be considered an estimate.

N -- There was insufficient sample available to perform a spike and/or duplicate on this analytical batch.

NC -- Not calculated due to matrix interference

QD -- The sample duplicate or matrix spike duplicate analysis demonstrated sample imprecision. The reported result should be considered an estimate.

QL -- The result for the laboratory control sample (LCS) was outside WETLAB acceptance criteria and reanalysis was not possible. The reported data should be considered an estimate.

S -- Surrogate recovery was outside of laboratory acceptance limits due to matrix interference. The associated blank and LCS surrogate recovery was within acceptance limits

SC -- Spike recovery not calculated. Sample concentration >4X the spike amount; therefore, the spike could not be adequately recovered

U -- The analyte was analyzed for, but was not detected above the level of the reported sample reporting/quantitation limit

General Lab Comments

Per method recommendation (section 4.4), Samples analyzed by methods EPA 300.0 and EPA 300.1 have been filtered prior to analysis.

The following is an interpretation of the results from EPA method 9223B:
A result of zero (0) indicates absence for both coliform and Escherichia coli meaning the water meets the microbiological requirements of the U.S. EPA Safe Drinking Water Act (SDWA). A result of one (1) for either test indicates presence and the water does not meet the SDWA requirements. Waters with positive tests should be disinfected by a certified water treatment operator and retested.

Per federal regulation the holding time for the following parameters in aqueous/water samples is 15 minutes: Residual Chlorine, pH, Dissolved Oxygen, Sulfite.

Western Environmental Testing Laboratory
Analytical Report

Balance Hydrologics
800 Baucroft Ave. Suite 101
Berkeley, CA 94710
Attn: Brian Hastings
Phone: (510-704-1000 **Fax:**

Date Printed: 1/31/2019
OrderID: *19010528*

Customer Sample ID: TC@SMP
WETLAB Sample ID: 19010528-001
Collect Date/Time: 1/17/2019 10:45
Receive Date: 1/17/2019 17:00

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.38	mg/L	1	0.010	1/18/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.36	mg/L	2	0.020	1/22/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	50	mg/L	1	1.0	1/18/2019	NV00925
Total Nitrogen	Calc.	2.2	mg/L	1	0.22	1/22/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	120	mg/L	1	10	1/18/2019	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	1.1	mg/L	1	0.020	1/19/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	1.1	mg/L	0.5	0.20	1/22/2019	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Customer Sample ID: WC@OUH
WETLAB Sample ID: 19010528-002
Collect Date/Time: 1/17/2019 10:35
Receive Date: 1/17/2019 17:00

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.33	mg/L	1	0.010	1/18/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.22	mg/L	1	0.010	1/18/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	33	mg/L	1	1.0	1/18/2019	NV00925
Total Nitrogen	Calc.	1.3	mg/L	1	0.22	1/22/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	53	mg/L	1	10	1/18/2019	NV00925
Microbiological Analyses							
Total Coliform (MPN)	SM 9223B (Quantitray)	>2419.6	MPN/100ml	1	1.0	1/17/2019	NV00925
Escherichia Coli (MPN)	SM 9223B (Quantitray)	816.4	MPN/100ml	1	1.0	1/17/2019	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	0.49	mg/L	1	0.020	1/19/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.84	mg/L	0.5	0.20	1/22/2019	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Customer Sample ID: AC@TR
WETLAB Sample ID: 19010528-003

Collect Date/Time: 1/17/2019 12:25
Receive Date: 1/17/2019 17:00

Analyte	**Method**	**Results**	**Units**	**DF**	**RL**	**Analyzed**	**LabID**
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.042	mg/L	1	0.010	1/18/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.087	mg/L	1	0.010	1/18/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	45	mg/L	1	1.0	1/18/2019	NV00925
Total Nitrogen	Calc.	1.0	mg/L	1	0.22	1/22/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	280	mg/L	1	10	1/18/2019	NV00925
Microbiological Analyses							
Total Coliform (MPN)	SM 9223B (Quantitray)	>2419.6	MPN/100ml	1	1.0	1/17/2019	NV00925
Escherichia Coli (MPN)	SM 9223B (Quantitray)	209.8	MPN/100ml	1	1.0	1/17/2019	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	0.46	mg/L	1	0.020	1/19/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.56	mg/L	0.5	0.20	1/22/2019	NV00925

Customer Sample ID: CC@CB
WETLAB Sample ID: 19010528-004

Collect Date/Time: 1/17/2019 13:45
Receive Date: 1/17/2019 17:00

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Orthophosphate, as P	SM 4500-P E	0.22		mg/L	1	0.010	1/18/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.37		mg/L	1	0.010	1/18/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	73		mg/L	1	1.0	1/18/2019	NV00925
Total Nitrogen	Calc.	1.6		mg/L	1	0.24	1/24/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	600		mg/L	1	10	1/18/2019	NV00925
Anions by Ion Chromatography								
Nitrate Nitrogen	EPA 300.0	0.71		mg/L	2	0.020	1/18/2019	NV00925
Nitrite Nitrogen	EPA 300.0	ND	D	mg/L	2	0.020	1/18/2019	NV00925
Flow Injection Analyses								
Total Kjeldahl Nitrogen	EPA 351.2	0.84	M	mg/L	0.5	0.20	1/24/2019	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Customer Sample ID: SBC@RHR
WETLAB Sample ID: 19010528-005

Collect Date/Time: 1/17/2019 10:10
Receive Date: 1/17/2019 17:00

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.20	mg/L	1	0.010	1/18/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.27	mg/L	1	0.010	1/18/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	56	mg/L	1	1.0	1/18/2019	NV00925
Total Nitrogen	Calc.	1.8	mg/L	1	0.22	1/24/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	150	mg/L	1	10	1/18/2019	NV00925
Microbiological Analyses							
Total Coliform (MPN)	SM 9223B (Quantitray)	>2419.6	MPN/100ml	1	1.0	1/17/2019	NV00925
Escherichia Coli (MPN)	SM 9223B (Quantitray)	686.7	MPN/100ml	1	1.0	1/17/2019	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	0.56	mg/L	1	0.020	1/19/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	1.2	mg/L	0.5	0.20	1/24/2019	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Customer Sample ID: SBC@NAR
WETLAB Sample ID: 19010528-006

Collect Date/Time: 1/17/2019 11:10
Receive Date: 1/17/2019 17:00

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.37	mg/L	1	0.010	1/18/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.41	mg/L	1	0.010	1/31/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	330	mg/L	1	1.0	1/18/2019	NV00925
Total Nitrogen	Calc.	2.8	mg/L	1	0.22	1/24/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	260	mg/L	1	10	1/18/2019	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	0.60	mg/L	1	0.020	1/19/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	2.2	mg/L	0.5	0.20	1/24/2019	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Customer Sample ID: NTD@BFD(2)
WETLAB Sample ID: 19010528-007

Collect Date/Time: 1/16/2019 23:00
Receive Date: 1/17/2019 17:00

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.12	mg/L	1	0.010	1/18/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.12	mg/L	1	0.010	1/18/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	120	mg/L	1	1.0	1/18/2019	NV00925
Total Nitrogen	Calc.	1.9	mg/L	1	0.22	1/24/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	200	mg/L	1	10	1/18/2019	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	0.50	mg/L	1	0.020	1/19/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	1.4	mg/L	0.5	0.20	1/24/2019	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Customer Sample ID: NTD@BFD(3) **Collect Date/Time:** 1/17/2019 01:15
WETLAB Sample ID: 19010528-008 **Receive Date:** 1/17/2019 17:00

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.12	mg/L	1	0.010	1/18/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.45	mg/L	1	0.010	1/18/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	230	mg/L	1	1.0	1/18/2019	NV00925
Total Nitrogen	Calc.	2.2	mg/L	1	0.22	1/24/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	65	mg/L	1	10	1/18/2019	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	0.29	mg/L	1	0.020	1/19/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	1.9	mg/L	0.5	0.20	1/24/2019	NV00925

Customer Sample ID: NTD@BFD(4)
WETLAB Sample ID: 19010528-009
Collect Date/Time: 1/17/2019 03:30
Receive Date: 1/17/2019 17:00

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.26	mg/L	1	0.010	1/18/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.23	mg/L	1	0.010	1/18/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	240	mg/L	1	1.0	1/18/2019	NV00925
Total Nitrogen	Calc.	2.6	mg/L	1	0.22	1/24/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	290	mg/L	1	10	1/18/2019	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	0.77	mg/L	1	0.020	1/19/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	1.8	mg/L	0.5	0.20	1/24/2019	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Customer Sample ID: H-19(2)
WETLAB Sample ID: 19010528-010

Collect Date/Time: 1/16/2019 22:20
Receive Date: 1/17/2019 17:00

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.14	mg/L	1	0.010	1/18/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.23	mg/L	1	0.010	1/18/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	240	mg/L	1	1.0	1/18/2019	NV00925
Total Nitrogen	Calc.	2.2	mg/L	1	0.22	1/24/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	24	mg/L	1	10	1/18/2019	NV00925
Anions by Ion Chromatography							
Nitrate Nitrogen	EPA 300.0	0.10	mg/L	1	0.010	1/18/2019	NV00925
Nitrite Nitrogen	EPA 300.0	ND	mg/L	1	0.010	1/18/2019	NV00925
Flow Injection Analyses							
Total Kjeldahl Nitrogen	EPA 351.2	2.1	mg/L	0.5	0.20	1/24/2019	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Customer Sample ID: H-19(3)
WETLAB Sample ID: 19010528-011
Collect Date/Time: 1/16/2019 23:26
Receive Date: 1/17/2019 17:00

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.14	mg/L	1	0.010	1/18/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.43	mg/L	5	0.050	1/18/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	150	mg/L	1	1.0	1/18/2019	NV00925
Total Nitrogen	Calc.	1.4	mg/L	1	0.22	1/24/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	18	mg/L	1	10	1/18/2019	NV00925
Anions by Ion Chromatography							
Nitrate Nitrogen	EPA 300.0	0.12	mg/L	1	0.010	1/18/2019	NV00925
Nitrite Nitrogen	EPA 300.0	0.022	mg/L	1	0.010	1/18/2019	NV00925
Flow Injection Analyses							
Total Kjeldahl Nitrogen	EPA 351.2	1.3	mg/L	0.5	0.20	1/24/2019	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Customer Sample ID: D-16(2)
WETLAB Sample ID: 19010528-012
Collect Date/Time: 1/16/2019 23:03
Receive Date: 1/17/2019 17:00

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.17	mg/L	1	0.010	1/18/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.49	mg/L	5	0.050	1/18/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	310	mg/L	1	1.0	1/18/2019	NV00925
Total Nitrogen	Calc.	1.9	mg/L	1	0.22	1/24/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	63	mg/L	1	10	1/18/2019	NV00925
Anions by Ion Chromatography							
Nitrate Nitrogen	EPA 300.0	0.26	mg/L	1	0.010	1/18/2019	NV00925
Nitrite Nitrogen	EPA 300.0	0.025	mg/L	1	0.010	1/18/2019	NV00925
Flow Injection Analyses							
Total Kjeldahl Nitrogen	EPA 351.2	1.6	mg/L	0.5	0.20	1/24/2019	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Customer Sample ID: D-16(3)

WETLAB Sample ID: 19010528-013

Collect Date/Time: 1/17/2019 01:10

Receive Date: 1/17/2019 17:00

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.17	mg/L	1	0.010	1/18/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.44	mg/L	5	0.050	1/18/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	430	mg/L	1	1.0	1/18/2019	NV00925
Total Nitrogen	Calc.	2.2	mg/L	1	0.22	1/24/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	26	mg/L	1	10	1/18/2019	NV00925
Anions by Ion Chromatography							
Nitrate Nitrogen	EPA 300.0	0.17	mg/L	1	0.010	1/18/2019	NV00925
Nitrite Nitrogen	EPA 300.0	0.014	mg/L	1	0.010	1/18/2019	NV00925
Flow Injection Analyses							
Total Kjeldahl Nitrogen	EPA 351.2	2.0	mg/L	0.5	0.20	1/24/2019	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Customer Sample ID: D-16(4) **Collect Date/Time:** 1/17/2019 16:11
WETLAB Sample ID: 19010528-014 **Receive Date:** 1/17/2019 17:00

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Orthophosphate, as P	SM 4500-P E	0.30		mg/L	1	0.010	1/18/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.25	M	mg/L	1	0.010	1/18/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	23		mg/L	1	1.0	1/18/2019	NV00925
Total Nitrogen	Calc.	1.8		mg/L	1	0.24	1/24/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	140		mg/L	1	10	1/18/2019	NV00925
Anions by Ion Chromatography								
Nitrate Nitrogen	EPA 300.0	0.60		mg/L	2	0.020	1/18/2019	NV00925
Nitrite Nitrogen	EPA 300.0	0.050		mg/L	2	0.020	1/18/2019	NV00925
Flow Injection Analyses								
Total Kjeldahl Nitrogen	EPA 351.2	1.2	M	mg/L	0.5	0.20	1/24/2019	NV00925

Customer Sample ID: C-24(1) **Collect Date/Time:** 1/16/2019 11:35
WETLAB Sample ID: 19010528-015 **Receive Date:** 1/17/2019 17:00

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.12	mg/L	1	0.010	1/18/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.26	mg/L	5	0.050	1/18/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	150	mg/L	1	1.0	1/18/2019	NV00925
Total Nitrogen	Calc.	1.4	mg/L	1	0.22	1/24/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	180	mg/L	1	10	1/18/2019	NV00925
Anions by Ion Chromatography							
Nitrate Nitrogen	EPA 300.0	0.22	mg/L	1	0.010	1/17/2019	NV00925
Nitrite Nitrogen	EPA 300.0	0.027	mg/L	1	0.010	1/17/2019	NV00925
Flow Injection Analyses							
Total Kjeldahl Nitrogen	EPA 351.2	1.2	mg/L	0.5	0.20	1/24/2019	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Customer Sample ID: C-24(2)
WETLAB Sample ID: 19010528-016

Collect Date/Time: 1/16/2019 22:17
Receive Date: 1/17/2019 17:00

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.11	mg/L	1	0.010	1/18/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.20	mg/L	1	0.010	1/18/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	160	mg/L	1	1.0	1/18/2019	NV00925
Total Nitrogen	Calc.	1.4	mg/L	1	0.22	1/24/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	ND	mg/L	1	10	1/18/2019	NV00925
Anions by Ion Chromatography							
Nitrate Nitrogen	EPA 300.0	0.21	mg/L	1	0.010	1/18/2019	NV00925
Nitrite Nitrogen	EPA 300.0	0.013	mg/L	1	0.010	1/18/2019	NV00925
Flow Injection Analyses							
Total Kjeldahl Nitrogen	EPA 351.2	1.2	mg/L	0.5	0.20	1/24/2019	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Customer Sample ID: C-24(3)
WETLAB Sample ID: 19010528-017

Collect Date/Time: 1/16/2019 22:23
Receive Date: 1/17/2019 17:00

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.11	mg/L	1	0.010	1/18/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.11	mg/L	1	0.010	1/18/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	210	mg/L	1	1.0	1/18/2019	NV00925
Total Nitrogen	Calc.	1.3	mg/L	1	0.22	1/24/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	27	mg/L	1	10	1/18/2019	NV00925
Anions by Ion Chromatography							
Nitrate Nitrogen	EPA 300.0	0.15	mg/L	1	0.010	1/18/2019	NV00925
Nitrite Nitrogen	EPA 300.0	ND	mg/L	1	0.010	1/18/2019	NV00925
Flow Injection Analyses							
Total Kjeldahl Nitrogen	EPA 351.2	1.2	mg/L	0.5	0.20	1/24/2019	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Customer Sample ID: C-24(4)
WETLAB Sample ID: 19010528-018

Collect Date/Time: 1/17/2019 14:28
Receive Date: 1/17/2019 17:00

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.23	mg/L	1	0.010	1/18/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.29	mg/L	1	0.010	1/18/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	22	mg/L	1	1.0	1/18/2019	NV00925
Total Nitrogen	Calc.	2.0	mg/L	1	0.24	1/24/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	110	mg/L	1	10	1/18/2019	NV00925
Anions by Ion Chromatography							
Nitrate Nitrogen	EPA 300.0	0.89	mg/L	2	0.020	1/18/2019	NV00925
Nitrite Nitrogen	EPA 300.0	0.028	mg/L	2	0.020	1/18/2019	NV00925
Flow Injection Analyses							
Total Kjeldahl Nitrogen	EPA 351.2	1.1	mg/L	0.5	0.20	1/24/2019	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Customer Sample ID: NTD@ORD
WETLAB Sample ID: 19010528-019

Collect Date/Time: 1/17/2019 11:50
Receive Date: 1/17/2019 17:00

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Orthophosphate, as P	SM 4500-P E	0.30		mg/L	1	0.010	1/18/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.19	M	mg/L	1	0.010	1/22/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	100		mg/L	1	1.0	1/18/2019	NV00925
Total Nitrogen	Calc.	2.6		mg/L	1	0.22	1/24/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	600		mg/L	1	10	1/18/2019	NV00925
Flow Injection Analyses								
Nitrate + Nitrite Nitrogen	EPA 353.2	0.90		mg/L	1	0.020	1/19/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	1.7		mg/L	0.5	0.20	1/24/2019	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Customer Sample ID: NTD@OKC
WETLAB Sample ID: 19010528-020

Collect Date/Time: 1/17/2019 12:30
Receive Date: 1/17/2019 17:00

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.31	mg/L	1	0.010	1/18/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.21	mg/L	1	0.010	1/22/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	100	mg/L	1	1.0	1/18/2019	NV00925
Total Nitrogen	Calc.	2.7	mg/L	1	0.22	1/24/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	640	mg/L	1	10	1/18/2019	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	0.90	mg/L	1	0.020	1/19/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	1.8	mg/L	0.5	0.20	1/24/2019	NV00925

Western Environmental Testing Laboratory
QC Report

QCBatchID	QCType	Parameter	Method	Result	Actual	% Rec	Units
QC19010584	Blank 1	Nitrate Nitrogen	EPA 300.0	ND			mg/L
		Nitrite Nitrogen	EPA 300.0	ND			mg/L
QC19010588	Blank 1	Orthophosphate, as P	SM 4500-P E	ND			mg/L
QC19010615	Blank 1	Total Coliform (MPN)	SM 9223B (Qu	ND			MPN/100ml
		Escherichia Coli (MPN)	SM 9223B (Qu	ND			MPN/100ml
QC19010628	Blank 1	Nitrate Nitrogen	EPA 300.0	ND			mg/L
		Nitrite Nitrogen	EPA 300.0	ND			mg/L
QC19010643	Blank 1	Nitrate + Nitrite Nitrogen	EPA 353.2	ND			mg/L
QC19010645	Blank 1	Nitrate + Nitrite Nitrogen	EPA 353.2	ND			mg/L
QC19010653	Blank 1	Total Suspended Solids (TSS)	SM 2540D	ND			mg/L
QC19010656	Blank 1	Total Suspended Solids (TSS)	SM 2540D	ND			mg/L
QC19010664	Blank 1	Total Dissolved Solids (TDS)	SM 2540C	ND			mg/L
QC19010665	Blank 1	Total Dissolved Solids (TDS)	SM 2540C	ND			mg/L
QC19010678	Blank 1	Total Phosphorous as P	SM 4500-P E	ND			mg/L
QC19010686	Blank 1	Total Kjeldahl Nitrogen	EPA 351.2	ND			mg/L
QC19010696	Blank 1	Total Phosphorous as P	SM 4500-P E	ND			mg/L
QC19010756	Blank 1	Total Kjeldahl Nitrogen	EPA 351.2	ND			mg/L

QCBatchID	QCType	Parameter	Method	Result	Actual	% Rec	Units
QC19010584	LCS 1	Nitrate Nitrogen	EPA 300.0	0.467	0.500	93	mg/L
		Nitrite Nitrogen	EPA 300.0	0.483	0.500	97	mg/L
QC19010588	LCS 1	Orthophosphate, as P	SM 4500-P E	0.254	0.250	102	mg/L
QC19010628	LCS 1	Nitrate Nitrogen	EPA 300.0	0.469	0.500	94	mg/L
		Nitrite Nitrogen	EPA 300.0	0.484	0.500	97	mg/L
QC19010643	LCS 1	Nitrate + Nitrite Nitrogen	EPA 353.2	0.796	0.800	99	mg/L
QC19010645	LCS 1	Nitrate + Nitrite Nitrogen	EPA 353.2	0.803	0.800	100	mg/L
QC19010653	LCS 1	Total Suspended Solids (TSS)	SM 2540D	198	200	99	mg/L
QC19010653	LCS 2	Total Suspended Solids (TSS)	SM 2540D	200	200	100	mg/L
QC19010656	LCS 1	Total Suspended Solids (TSS)	SM 2540D	198	200	99	mg/L
QC19010656	LCS 2	Total Suspended Solids (TSS)	SM 2540D	200	200	100	mg/L
QC19010664	LCS 1	Total Dissolved Solids (TDS)	SM 2540C	136	150	91	mg/L
QC19010664	LCS 2	Total Dissolved Solids (TDS)	SM 2540C	137	150	91	mg/L
QC19010665	LCS 1	Total Dissolved Solids (TDS)	SM 2540C	136	150	91	mg/L
QC19010665	LCS 2	Total Dissolved Solids (TDS)	SM 2540C	137	150	91	mg/L
QC19010678	LCS 1	Total Phosphorous as P	SM 4500-P E	0.274	0.250	110	mg/L
QC19010686	LCS 1	Total Kjeldahl Nitrogen	EPA 351.2	1.08	1.00	108	mg/L
QC19010696	LCS 1	Total Phosphorous as P	SM 4500-P E	0.279	0.250	112	mg/L
QC19010756	LCS 1	Total Kjeldahl Nitrogen	EPA 351.2	1.04	1.00	104	mg/L

QCBatchID	QCType	Parameter	Method	Duplicate Sample	Sample Result	Duplicate Result		Units	RPD
QC19010653	Duplicate 1	Total Suspended Solids (TSS)	SM 2540D	19010523-00	ND	ND		mg/L	17 %
QC19010653	Duplicate 2	Total Suspended Solids (TSS)	SM 2540D	19010523-00	60.0	61.0		mg/L	2 %
QC19010656	Duplicate 1	Total Suspended Solids (TSS)	SM 2540D	19010515-00	16.5	17.0		mg/L	3 %
QC19010656	Duplicate 2	Total Suspended Solids (TSS)	SM 2540D	19010515-00	13.3	15.7	QD	mg/L	16 %
QC19010664	Duplicate 1	Total Dissolved Solids (TDS)	SM 2540C	19010507-00	9350	9640		mg/L	3 %
QC19010664	Duplicate 2	Total Dissolved Solids (TDS)	SM 2540C	19010507-00	6160	6008		mg/L	2 %

QCBatchID	QCType	Parameter	Method	Duplicate Sample	Sample Result	Duplicate Result	Units	RPD
QC19010665	Duplicate 1	Total Dissolved Solids (TDS)	SM 2540C	19010510-00	926	958	mg/L	3 %
QC19010665	Duplicate 2	Total Dissolved Solids (TDS)	SM 2540C	19010511-00	1042	1012	mg/L	3 %

QCBatchID	QCType	Parameter	Method	Spike Sample	Sample Result		MS Result	MSD Result	Spike Value	Units	MS %Rec	MSD %Rec	RPD %
QC19010584	MS 1	Nitrate Nitrogen	EPA 300.0	19010475-001	0.126		0.620	0.622	0.5	mg/L	99	99	<1
		Nitrite Nitrogen	EPA 300.0	19010475-001	ND	M	0.092	0.083	0.125	mg/L	NC	NC	NC
QC19010588	MS 1	Orthophosphate, as P	SM 4500-P E	19010528-001	0.384		0.621	0.632	0.25	mg/L	95	100	2
QC19010588	MS 2	Orthophosphate, as P	SM 4500-P E	19010528-011	0.137		0.392	0.393	0.25	mg/L	102	102	<1
QC19010628	MS 1	Nitrate Nitrogen	EPA 300.0	19010528-010	0.103		0.596	0.618	0.5	mg/L	99	103	4
		Nitrite Nitrogen	EPA 300.0	19010528-010	ND		0.133	0.137	0.125	mg/L	99	102	3
QC19010628	MS 2	Nitrate Nitrogen	EPA 300.0	19010535-006	0.895		1.89	1.91	0.5	mg/L	99	102	1
		Nitrite Nitrogen	EPA 300.0	19010535-006	0.028		0.280	0.265	0.125	mg/L	101	95	6
QC19010643	MS 1	Nitrate + Nitrite Nitrogen	EPA 353.2	19010481-001	ND		5.11	5.19	1	mg/L	100	102	2
QC19010643	MS 2	Nitrate + Nitrite Nitrogen	EPA 353.2	19010510-001	0.576		5.68	5.69	1	mg/L	102	102	<1
QC19010645	MS 1	Nitrate + Nitrite Nitrogen	EPA 353.2	19010528-002	0.491		1.49	1.51	1	mg/L	100	102	1
QC19010645	MS 2	Nitrate + Nitrite Nitrogen	EPA 353.2	19010530-002	2.22	M	4.84	4.98	1	mg/L	NC	NC	NC
QC19010678	MS 1	Total Phosphorous as P	SM 4500-P E	19010528-001	0.356		0.887	0.735	0.25	mg/L	106	76	19
QC19010678	MS 2	Total Phosphorous as P	SM 4500-P E	19010528-014	0.250	M	0.396	0.399	0.25	mg/L	NC	NC	NC
QC19010686	MS 1	Total Kjeldahl Nitrogen	EPA 351.2	19010494-001	0.695		1.14	1.12	0.5	mg/L	90	85	2
QC19010686	MS 2	Total Kjeldahl Nitrogen	EPA 351.2	19010528-001	1.14		1.64	1.72	0.5	mg/L	99	116	5
QC19010696	MS 1	Total Phosphorous as P	SM 4500-P E	19010515-001	0.272	M	0.677	0.682	0.25	mg/L	NC	NC	NC
QC19010696	MS 2	Total Phosphorous as P	SM 4500-P E	19010528-019	0.194	M	0.507	0.494	0.25	mg/L	NC	NC	NC
QC19010756	MS 1	Total Kjeldahl Nitrogen	EPA 351.2	19010528-004	0.845	M	1.26	1.29	0.5	mg/L	NC	NC	NC
QC19010756	MS 2	Total Kjeldahl Nitrogen	EPA 351.2	19010528-014	1.17	M	2.02	2.08	0.5	mg/L	NC	NC	NC

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1084 Lamoille Highway | Elko, Nevada 89801
tel (775) 777-9933 | fax (775) 777-9933
3230 Polaris Ave., Suite 4 | Las Vegas, Nevada 89102
tel (702) 475-8899 | fax (702) 776-6152

WETLAB Order ID. 19010528
Sparks Control # ____
Elko Control # ____
LV Control # ____
Report Due Date ____
Page 1 of 3

Client Balance Hydrologics
Address on file
City, State & Zip ____
Contact ____
Phone ____ Collector's Name ____
Fax ____ PWS/Project Name ____
P.O. Number ____ PWS/Project Number ____
Email ____

Turnaround Time Requirements
Standard X
5 Day* (25%) ____ 72 Hour* (50%) ____
48 Hour* (100%) ____ 24 Hour* (200%) ____
*Surcharges Will Apply

Samples Collected From Which State?
NV X CA ____ Other ____

Report Results Via
[✓ PDF] EDD Other ____

Compliance Monitoring?
Yes [✓ No]

Report to Regulatory Agency?
Yes [✓ No]

Standard QC Required?
[✓ Yes] No

Billing Address (if different than Client Address)
Company ____
Address ____
City, State & Zip ____
Contact ____
Phone ____ Fax ____
Email ____

SAMPLE ID/LOCATION	DATE	TIME	PRES TYPE *	SAMPLE TYPE **	NO. OF CONTAINERS	Total N	Total P	Ortho P	TSS	TDS	NO_3	Ecoli				Spl. No.
TC @ SUMP	1/17/19	10:45		Aq	2	X	X	X	X	X						1
WC @ OVH		10:35			3	X	X	X	X	X		X				2
AC @ TR		12:25			3	X	X	X	X	X		X				3
LC @ CB		13:45			2	X	X	X	X	X	X					4
SBC @ RHR		10:10			3	X	X	X	X	X		X				5
SBC @ NAR		11:10			2	X	X	X	X	X						6
NTD @ BFD (2)	1/16/19	23:00			2	X	X	X	X	X						7
NTD @ BFD (3)	1/17/19	1:15			2	X	X	X	X	X						8
NTD @ BFD (4)	1/17/19	3:30			2	X	X	X	X	X						9

1901 1
0528 20

Instructions/Comments/Special Requirements:

Sample Matrix Key** DW = Drinking Water WW = Wastewater SW = Surface Water MW = Monitoring Well SD = Solid/Sludge SO = Soil HW = Hazardous Waste OTHER: ____

***SAMPLE PRESERVATIVES:** 1=Unpreserved 2=H2SO4 3=NaOH 4=HCl 5=HNO3 6=Na2S2O3 7=ZnOAc+NaOH 8=HCl/VOA Vial

Temp	Custody Seal	# of Containers	DATE	TIME	Samples Relinquished By	Samples Received By
4.6 °C	Y N [✓ None]	40	1/17/19	1700		
°C	Y N None					
°C	Y N None					
°C	Y N None					

WETLAB'S Standard Terms and Conditions apply unless written agreements specify otherwise. Payment terms are Net 30.

Client/Collector attests to the validity and authenticity of this (these) sample(s) and, is (are) aware that tampering with or intentionally mislabeling the sample(s) location, date or time of collection may be considered fraud and subject to legal action (NAC445.0636). ________ initial

To the maximum extent permitted by law, the Client agrees to limit the liability of WETLAB for the Client's damages to the total compensation received, unless other agreements are made in writing. This limitation shall apply regardless of the cause of action or legal theory pled or asserted. ________ initial

WETLAB will dispose of samples 90 days from sample receipt. Client may request a longer sample storage time for an additional fee. Please contact your Project Manager for details. ________ initial

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WETLAB Order ID. 19010528
Sparks Control #
Elko Control #
LV Control #
Report Due Date
Page 2 of 3

Client
Address
City, State & Zip
Contact
Phone
Collector's Name
Fax
PWS/Project Name
P.O. Number
PWS/Project Number
Email

Turnaround Time Requirements
Standard
5 Day* (25%) 72 Hour* (50%)
48 Hour* (100%) 24 Hour* (200%)
*Surcharges Will Apply

Samples Collected From Which State?
NV CA Other

Compliance Monitoring?
Yes No

Report Results Via
PDF EDD Other

Report to Regulatory Agency?
Yes No

Standard QC Required?
Yes No

Billing Address (if different than Client Address)
Company
Address
City, State & Zip
Contact
Phone Fax
Email

Analyses Requested

SAMPLE ID/LOCATION	DATE	TIME	PRES TYPE *	SAMPLE TYPE **	NO. OF CONTAINERS	Total N	Total P	OrthoP	TSS	TDS	NO3					Spl. No.
H-19 (2)	1/16/19	22:20		Aq	2	X	X	X	X	X	X					10
H-19 (3)	1/16/19	23:26		|	|	X	X	X	X	X	X					11
D-16 (2)	1/16/19	23:03		|	|	X	X	X	X	X	X					12
D-16 (3)	1/17/19	1:10		|	|	X	X	X	X	X	X					13
D-16 (4)	1/17/19	16:11		|	|	X	X	X	X	X	X					14
C-24 (1)	1/16/19	11:35		|	|	X	X	X	X	X	X					15
C-24 (2)	1/16/19	22:17		|	|	X	X	X	X	X	X					16
C-24 (3)	1/16/19	22:23		|	|	X	X	X	X	X	X					17
C-24 (4)	1/17/19	14:28		|	|	X	X	X	X	X	X					18

1901 1
0528 20

Instructions/Comments/Special Requirements:

Sample Matrix Key** **DW** = Drinking Water **WW** = Wastewater **SW** = Surface Water **MW** = Monitoring Well **SD** = Solid/Sludge **SO** = Soil **HW** = Hazardous Waste **OTHER:**

***SAMPLE PRESERVATIVES:** 1=Unpreserved 2=H2SO4 3=NaOH 4=HCl 5=HNO3 6=Na2S2O3 7=ZnOAc+NaOH 8=HCl/VOA Vial

Temp	Custody Seal	# of Containers	DATE	TIME	Samples Relinquished By	Samples Received By
4.6 °C	Y N [✓ None]	40	1/17/19	1700		
°C	Y N None					
°C	Y N None					
°C	Y N None					

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WETLAB Order ID. 19010528
Sparks Control # ______
Elko Control # ______
LV Control # ______
Report Due Date ______
Page 3 of 5

Client ______
Address ______
City, State & Zip ______
Contact ______
Phone ______ Collector's Name ______
Fax ______ PWS/Project Name ______
P.O. Number ______ PWS/Project Number ______
Email ______

Turnaround Time Requirements
Standard ______
5 Day* (25%) ______ 72 Hour* (50%) ______
48 Hour* (100%) ______ 24 Hour* (200%) ______
*Surcharges Will Apply

Samples Collected From Which State?
NV____ CA____ Other____

Compliance Monitoring? Yes No

Report Results Via PDF EDD Other ______

Report to Regulatory Agency? Yes No

Standard QC Required? Yes No

Billing Address (if different than Client Address)
Company ______
Address ______
City, State & Zip ______
Contact ______
Phone ______ Fax ______
Email ______

SAMPLE ID/LOCATION	DATE	TIME	PRES TYPE *	SAMPLE TYPE **	NO. OF CONTAINERS	Total N	Total P	OrthoP	TSS	TDS						Spl. No.
NTD @ ORD	1/17/19	11:50		Aq	2	X	X	X	X	X						19
NTD @ OKC	1/17/19	12:30		|	2	X	X	X	X	X						20

1901 2
0528 20

Instructions/Comments/Special Requirements:

Sample Matrix Key** DW = Drinking Water WW = Wastewater SW = Surface Water MW = Monitoring Well SD = Solid/Sludge SO = Soil HW = Hazardous Waste OTHER: ______

***SAMPLE PRESERVATIVES:** 1=Unpreserved 2=H2SO4 3=NaOH 4=HCl 5=HNO3 6=Na2S2O3 7=ZnOAc+NaOH 8=HCl/VOA Vial

Temp	Custody Seal	# of Containers	DATE	TIME	Samples Relinquished By	Samples Received By
4.6 °C	Y N [✓ None]	40	1/17/19	1700		
°C	Y N None					
°C	Y N None					
°C	Y N None					

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Client/Collector attests to the validity and authenticity of this (these) sample(s) and, is (are) aware that tampering with or intentionally mislabeling the sample(s) location, date or time of collection may be considered fraud and subject to legal action (NAC445.0636). ________ initial

To the maximum extent permitted by law, the Client agrees to limit the liability of WETLAB for the Client's damages to the total compensation received, unless other agreements are made in writing. This limitation shall apply regardless of the cause of action or legal theory pled or asserted. ________ initial

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Specializing in Soil, Hazardous Waste and Water Analysis

2/5/2019

Balance Hydrologics
800 Baucroft Ave. Suite 101
Berkeley, CA 94710
Attn: Brian Hastings

OrderID: *19010535*

Dear: Brian Hastings

This is to transmit the attached analytical report. The analytical data and information contained therein was generated using specified or selected methods contained in references, such as Standard Methods for the Examination of Water and Wastewater, online edition, Methods for Determination of Organic Compounds in Drinking Water, EPA-600/4-79-020, and Test Methods for Evaluation of Solid Waste, Physical/Chemical Methods (SW846) Third Edition.

The samples were received by WETLAB-Western Environmental Testing Laboratory in good condition on 1/18/2019. Additional comments are located on page 2 of this report.

If you should have any questions or comments regarding this report, please do not hesitate to call.

Sincerely,

Jennifer Delaney
QA Specialist

Western Environmental Testing Laboratory
Report Comments

Balance Hydrologics - 19010535

Specific Report Comments

The result for Orthophosphate on sample 19010535-003 is higher than expected, especially when compared to Total Phosphorus results. It is thought that particulate matter contained in the samples interfered with the Orthophosphate result since the particulate matter interferes by deflecting the light used in the spectrophotometric method. The particulate matter did not interfere with the Total Phosphorus analysis since that procedure includes an acid digestion process.

Report Legend

B -- Blank contamination; Analyte detected above the method reporting limit in an associated blank

D -- Due to the sample matrix dilution was required in order to properly detect and report the analyte. The reporting limit has been adjusted accordingly.

HT -- Sample analyzed beyond the accepted holding time

J -- The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit

M -- The matrix spike/matrix spike duplicate (MS/MSD) values for the analysis of this parameter were outside acceptance criteria due to probable matrix interference. The reported result should be considered an estimate.

N -- There was insufficient sample available to perform a spike and/or duplicate on this analytical batch.

NC -- Not calculated due to matrix interference

QD -- The sample duplicate or matrix spike duplicate analysis demonstrated sample imprecision. The reported result should be considered an estimate.

QL -- The result for the laboratory control sample (LCS) was outside WETLAB acceptance criteria and reanalysis was not possible. The reported data should be considered an estimate.

S -- Surrogate recovery was outside of laboratory acceptance limits due to matrix interference. The associated blank and LCS surrogate recovery was within acceptance limits

SC -- Spike recovery not calculated. Sample concentration >4X the spike amount; therefore, the spike could not be adequately recovered

U -- The analyte was analyzed for, but was not detected above the level of the reported sample reporting/quantitation limit

General Lab Comments

Per method recommendation (section 4.4), Samples analyzed by methods EPA 300.0 and EPA 300.1 have been filtered prior to analysis.

The following is an interpretation of the results from EPA method 9223B:
A result of zero (0) indicates absence for both coliform and Escherichia coli meaning the water meets the microbiological requirements of the U.S. EPA Safe Drinking Water Act (SDWA). A result of one (1) for either test indicates presence and the water does not meet the SDWA requirements. Waters with positive tests should be disinfected by a certified water treatment operator and retested.

Per federal regulation the holding time for the following parameters in aqueous/water samples is 15 minutes: Residual Chlorine, pH, Dissolved Oxygen, Sulfite.

Western Environmental Testing Laboratory
Analytical Report

Balance Hydrologics
800 Baucroft Ave. Suite 101
Berkeley, CA 94710
Attn: Brian Hastings
Phone: (510-704-1000 **Fax:**

Date Printed: 2/5/2019
OrderID: *19010535*

Customer Sample ID: SBC@CWW(2)
WETLAB Sample ID: 19010535-001

Collect Date/Time: 1/16/2019 20:00
Receive Date: 1/18/2019 15:10

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.14	mg/L	1	0.010	1/18/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.20	mg/L	1	0.010	1/22/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	280	mg/L	1	1.0	1/22/2019	NV00925
Total Nitrogen	Calc.	2.1	mg/L	1	0.22	1/25/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	280	mg/L	1	10	1/23/2019	NV00925
Anions by Ion Chromatography							
Nitrate Nitrogen	EPA 300.0	0.53	mg/L	1	0.010	1/18/2019	NV00925
Nitrite Nitrogen	EPA 300.0	ND	mg/L	1	0.010	1/18/2019	NV00925
Flow Injection Analyses							
Total Kjeldahl Nitrogen	EPA 351.2	1.6	mg/L	0.5	0.20	1/25/2019	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Customer Sample ID: SBC@CWW(3)
WETLAB Sample ID: 19010535-002

Collect Date/Time: 1/17/2019 04:00
Receive Date: 1/18/2019 15:10

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.31	mg/L	1	0.010	1/18/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.39	mg/L	1	0.010	1/22/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	680	mg/L	1	1.0	1/22/2019	NV00925
Total Nitrogen	Calc.	3.5	mg/L	1	0.22	1/25/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	270	mg/L	1	10	1/23/2019	NV00925
Anions by Ion Chromatography							
Nitrate Nitrogen	EPA 300.0	0.72	mg/L	1	0.010	1/18/2019	NV00925
Nitrite Nitrogen	EPA 300.0	0.038	mg/L	1	0.010	1/18/2019	NV00925
Flow Injection Analyses							
Total Kjeldahl Nitrogen	EPA 351.2	2.8	mg/L	0.5	0.20	1/25/2019	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Customer Sample ID: SBC@CWW(4)
WETLAB Sample ID: 19010535-003

Collect Date/Time: 1/17/2019 14:00
Receive Date: 1/18/2019 15:10

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Orthophosphate, as P	SM 4500-P E	0.31		mg/L	1	0.010	1/18/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.23	M	mg/L	1	0.010	1/23/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	260		mg/L	1	1.0	1/22/2019	NV00925
Total Nitrogen	Calc.	2.8		mg/L	1	0.22	1/25/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	240		mg/L	1	10	1/23/2019	NV00925
Anions by Ion Chromatography								
Nitrate Nitrogen	EPA 300.0	0.88		mg/L	1	0.010	1/18/2019	NV00925
Nitrite Nitrogen	EPA 300.0	0.020		mg/L	1	0.010	1/18/2019	NV00925
Flow Injection Analyses								
Total Kjeldahl Nitrogen	EPA 351.2	1.9		mg/L	0.5	0.20	1/25/2019	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Customer Sample ID: YD@SBC(2)
WETLAB Sample ID: 19010535-004

Collect Date/Time: 1/17/2019 00:30
Receive Date: 1/18/2019 15:10

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.13	mg/L	1	0.010	1/18/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.36	mg/L	1	0.010	1/24/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	700	mg/L	1	1.0	1/22/2019	NV00925
Total Nitrogen	Calc.	3.8	mg/L	1	0.22	1/25/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	120	mg/L	1	10	1/23/2019	NV00925
Anions by Ion Chromatography							
Nitrate Nitrogen	EPA 300.0	0.50	mg/L	1	0.010	1/18/2019	NV00925
Nitrite Nitrogen	EPA 300.0	0.028	mg/L	1	0.010	1/18/2019	NV00925
Flow Injection Analyses							
Total Kjeldahl Nitrogen	EPA 351.2	3.3	mg/L	0.5	0.20	1/25/2019	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Customer Sample ID: YD@SBC(3)
WETLAB Sample ID: 19010535-005

Collect Date/Time: 1/17/2019 04:15
Receive Date: 1/18/2019 15:10

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.24	mg/L	1	0.010	1/18/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.26	mg/L	1	0.010	1/24/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	410	mg/L	1	1.0	1/22/2019	NV00925
Total Nitrogen	Calc.	2.8	mg/L	1	0.22	1/25/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	220	mg/L	1	10	1/23/2019	NV00925
Anions by Ion Chromatography							
Nitrate Nitrogen	EPA 300.0	0.66	mg/L	1	0.010	1/18/2019	NV00925
Nitrite Nitrogen	EPA 300.0	0.019	mg/L	1	0.010	1/18/2019	NV00925
Flow Injection Analyses							
Total Kjeldahl Nitrogen	EPA 351.2	2.1	mg/L	0.5	0.20	1/25/2019	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Customer Sample ID: YD@SBC(4)
WETLAB Sample ID: 19010535-006
Collect Date/Time: 1/18/2019 12:55
Receive Date: 1/18/2019 15:10

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.15	mg/L	1	0.010	1/18/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.15	mg/L	1	0.010	2/5/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	45	mg/L	1	1.0	1/22/2019	NV00925
Total Nitrogen	Calc.	1.8	mg/L	1	0.24	1/25/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	260	mg/L	1	10	1/23/2019	NV00925
Anions by Ion Chromatography							
Nitrate Nitrogen	EPA 300.0	0.89	mg/L	2	0.020	1/18/2019	NV00925
Nitrite Nitrogen	EPA 300.0	0.028	mg/L	2	0.020	1/18/2019	NV00925
Flow Injection Analyses							
Total Kjeldahl Nitrogen	EPA 351.2	0.92	mg/L	0.5	0.20	1/25/2019	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Western Environmental Testing Laboratory
QC Report

QCBatchID	QCType	Parameter	Method	Result	Actual	% Rec	Units
QC19010612	Blank 1	Orthophosphate, as P	SM 4500-P E	ND			mg/L
QC19010628	Blank 1	Nitrate Nitrogen	EPA 300.0	ND			mg/L
		Nitrite Nitrogen	EPA 300.0	ND			mg/L
QC19010696	Blank 1	Total Phosphorous as P	SM 4500-P E	ND			mg/L
QC19010718	Blank 1	Total Phosphorous as P	SM 4500-P E	ND			mg/L
QC19010723	Blank 1	Total Suspended Solids (TSS)	SM 2540D	ND			mg/L
QC19010750	Blank 1	Total Phosphorous as P	SM 4500-P E	ND			mg/L
QC19010794	Blank 1	Total Kjeldahl Nitrogen	EPA 351.2	ND			mg/L
QC19010797	Blank 1	Total Dissolved Solids (TDS)	SM 2540C	ND			mg/L
QC19010799	Blank 1	Total Dissolved Solids (TDS)	SM 2540C	ND			mg/L

QCBatchID	QCType	Parameter	Method	Result	Actual	% Rec	Units
QC19010612	LCS 1	Orthophosphate, as P	SM 4500-P E	0.265	0.250	106	mg/L
QC19010628	LCS 1	Nitrate Nitrogen	EPA 300.0	0.469	0.500	94	mg/L
		Nitrite Nitrogen	EPA 300.0	0.484	0.500	97	mg/L
QC19010696	LCS 1	Total Phosphorous as P	SM 4500-P E	0.279	0.250	112	mg/L
QC19010718	LCS 1	Total Phosphorous as P	SM 4500-P E	0.282	0.250	113	mg/L
QC19010723	LCS 1	Total Suspended Solids (TSS)	SM 2540D	200	200	100	mg/L
QC19010723	LCS 2	Total Suspended Solids (TSS)	SM 2540D	200	200	100	mg/L
QC19010750	LCS 1	Total Phosphorous as P	SM 4500-P E	0.279	0.250	112	mg/L
QC19010794	LCS 1	Total Kjeldahl Nitrogen	EPA 351.2	0.990	1.00	99	mg/L
QC19010797	LCS 1	Total Dissolved Solids (TDS)	SM 2540C	140	150	93	mg/L
QC19010797	LCS 2	Total Dissolved Solids (TDS)	SM 2540C	146	150	97	mg/L
QC19010799	LCS 1	Total Dissolved Solids (TDS)	SM 2540C	149	150	99	mg/L
QC19010799	LCS 2	Total Dissolved Solids (TDS)	SM 2540C	152	150	101	mg/L

QCBatchID	QCType	Parameter	Method	Duplicate Sample	Sample Result	Duplicate Result		Units	RPD
QC19010723	Duplicate 1	Total Suspended Solids (TSS)	SM 2540D	19010535-00	284	292		mg/L	3 %
QC19010723	Duplicate 2	Total Suspended Solids (TSS)	SM 2540D	19010535-00	260	256		mg/L	2 %
QC19010797	Duplicate 1	Total Dissolved Solids (TDS)	SM 2540C	19010537-05	254000	269000	QD	mg/L	6 %
QC19010797	Duplicate 2	Total Dissolved Solids (TDS)	SM 2540C	19010537-05	291000	282000		mg/L	3 %
QC19010799	Duplicate 1	Total Dissolved Solids (TDS)	SM 2540C	19010537-05	276000	256000	QD	mg/L	8 %

QCBatchID	QCType	Parameter	Method	Spike Sample	Sample Result		MS Result	MSD Result	Spike Value	Units	MS %Rec	MSD %Rec	RPD %
QC19010612	MS 1	Orthophosphate, as P	SM 4500-P E	19010530-001	0.145		0.394	0.388	0.25	mg/L	100	97	2
QC19010628	MS 1	Nitrate Nitrogen	EPA 300.0	19010528-010	0.103		0.596	0.618	0.5	mg/L	99	103	4
		Nitrite Nitrogen	EPA 300.0	19010528-010	ND		0.133	0.137	0.125	mg/L	99	102	3
QC19010628	MS 2	Nitrate Nitrogen	EPA 300.0	19010535-006	0.895		1.89	1.91	0.5	mg/L	99	102	1
		Nitrite Nitrogen	EPA 300.0	19010535-006	0.028		0.280	0.265	0.125	mg/L	101	95	6
QC19010696	MS 1	Total Phosphorous as P	SM 4500-P E	19010515-001	0.272	M	0.677	0.682	0.25	mg/L	NC	NC	NC
QC19010696	MS 2	Total Phosphorous as P	SM 4500-P E	19010528-019	0.194	M	0.507	0.494	0.25	mg/L	NC	NC	NC
QC19010718	MS 1	Total Phosphorous as P	SM 4500-P E	19010535-003	0.230	M	0.375	0.442	0.25	mg/L	NC	NC	NC
QC19010750	MS 1	Total Phosphorous as P	SM 4500-P E	19010587-001	0.212		1.57	1.60	0.25	mg/L	108	111	2
QC19010750	MS 2	Total Phosphorous as P	SM 4500-P E	19010592-001	1.29		2.74	2.66	0.25	mg/L	116	109	3
QC19010794	MS 1	Total Kjeldahl Nitrogen	EPA 351.2	19010350-001	0.525		1.08	1.04	0.5	mg/L	110	103	4

QCBatchID	QCType	Parameter	Method	Spike Sample	Sample Result		MS Result	MSD Result	Spike Value	Units	MS %Rec	MSD %Rec	RPD %
QC19010794	MS 2	Total Kjeldahl Nitrogen	EPA 351.2	19010533-009	0.209	M	0.770	0.765	0.5	mg/L	NC	NC	NC

WETLAB
WESTERN ENVIRONMENTAL TESTING LABORATORY
Specializing in Soil, Hazardous Waste and Water Analysis.

475 E. Greg Street #119 | Sparks, Nevada 89431 | www.WETLaboratory.com
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1084 Lamoille Highway | Elko, Nevada 89801
tel (775) 777-9933 | fax (775) 777-9933
3230 Polaris Ave., Suite 4 | Las Vegas, Nevada 89102
tel (702) 475-8899 | fax (702) 776-6152

WETLAB Order ID. 1901053 5
Sparks Control # ______
Elko Control # ______
LV Control # ______
Report Due Date ______
Page 1 of 1

Client Balance Hydrologics
Address on file
City, State & Zip
Contact Brian Hastings
Phone
Collector's Name
Fax
PWS/Project Name
P.O. Number
PWS/Project Number
Email

Turnaround Time Requirements
Standard X
5 Day* (25%) ______ 72 Hour* (50%) ______
48 Hour* (100%) ______ 24 Hour* (200%) ______
*Surcharges Will Apply

Samples Collected From Which State?
NV X CA ____ Other ____

Report Results Via
[✓ PDF] EDD Other ______

Compliance Monitoring?
Yes [✓ No]

Report to Regulatory Agency?
Yes [✓ No]

Standard QC Required?
[✓ Yes] No

Billing Address (if different than Client Address)
Company ______
Address ______
City, State & Zip ______
Contact ______
Phone ______ Fax ______
Email

Analyses Requested

SAMPLE ID/LOCATION	DATE	TIME	PRES TYPE *	SAMPLE TYPE **	NO. OF CONTAINERS	Total N	Total P	Ortho P	TSS	TDS						Spl. No.
SBC@CWW(2)	1/16/19	20:00		Aq	2	X	X	X	X	X						1
SBC@ CWW (3)	1/17/19	4:00			2											2
SBC @ CWW(4)	1/17/19	14:00			2											3
YD@SBC(2)	1/17/19	0:30			2											4
YD@SBC (3)	1/17/19	4:15			2											5
YD@ SBC(4)	1/18/19	12:55			2											6

1901 2
0535-6

Instructions/Comments/Special Requirements:

Sample Matrix Key** DW = Drinking Water WW = Wastewater SW = Surface Water MW = Monitoring Well SD = Solid/Sludge SO = Soil HW = Hazardous Waste OTHER: ______

***SAMPLE PRESERVATIVES:** 1=Unpreserved 2=H2SO4 3=NaOH 4=HCl 5=HNO3 6=Na2S2O3 7=ZnOAc+NaOH 8=HCl/VOA Vial

Temp	Custody Seal	# of Containers	DATE	TIME	Samples Relinquished By	Samples Received By
5.7 °C	Y N [✓ None]	12	1-18-19	15:10		
°C	Y N None					
°C	Y N None					
°C	Y N None					

WETLAB'S Standard Terms and Conditions apply unless written agreements specify otherwise. Payment terms are Net 30.

Client/Collector attests to the validity and authenticity of this (these) sample(s) and, is (are) aware that tampering with or intentionally mislabeling the sample(s) location, date or time of collection may be considered fraud and subject to legal action (NAC445.0636). ______ initial

To the maximum extent permitted by law, the Client agrees to limit the liability of WETLAB for the Client's damages to the total compensation received, unless other agreements are made in writing. This limitation shall apply regardless of the cause of action or legal theory pled or asserted. ______ initial

WETLAB will dispose of samples 90 days from sample receipt. Client may request a longer sample storage time for an additional fee. Please contact your Project Manager for details. ______ initial

2/15/2019

Balance Hydrologics
800 Baucroft Ave. Suite 101
Berkeley, CA 94710
Attn: Brian Hastings

OrderID: *19020061*

Dear: Brian Hastings

This is to transmit the attached analytical report. The analytical data and information contained therein was generated using specified or selected methods contained in references, such as Standard Methods for the Examination of Water and Wastewater, online edition, Methods for Determination of Organic Compounds in Drinking Water, EPA-600/4-79-020, and Test Methods for Evaluation of Solid Waste, Physical/Chemical Methods (SW846) Third Edition.

The samples were received by WETLAB-Western Environmental Testing Laboratory in good condition on 2/4/2019. Additional comments are located on page 2 of this report.

If you should have any questions or comments regarding this report, please do not hesitate to call.

Sincerely,

ASmith

Andy Smith
QA Manager

Western Environmental Testing Laboratory
Report Comments

Balance Hydrologics - 19020061

Specific Report Comments

None

Report Legend

B	--	Blank contamination; Analyte detected above the method reporting limit in an associated blank
D	--	Due to the sample matrix dilution was required in order to properly detect and report the analyte. The reporting limit has been adjusted accordingly.
HT	--	Sample analyzed beyond the accepted holding time
J	--	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit
M	--	The matrix spike/matrix spike duplicate (MS/MSD) values for the analysis of this parameter were outside acceptance criteria due to probable matrix interference. The reported result should be considered an estimate.
N	--	There was insufficient sample available to perform a spike and/or duplicate on this analytical batch.
NC	--	Not calculated due to matrix interference
QD	--	The sample duplicate or matrix spike duplicate analysis demonstrated sample imprecision. The reported result should be considered an estimate.
QL	--	The result for the laboratory control sample (LCS) was outside WETLAB acceptance criteria and reanalysis was not possible. The reported data should be considered an estimate.
S	--	Surrogate recovery was outside of laboratory acceptance limits due to matrix interference. The associated blank and LCS surrogate recovery was within acceptance limits
SC	--	Spike recovery not calculated. Sample concentration >4X the spike amount; therefore, the spike could not be adequately recovered
U	--	The analyte was analyzed for, but was not detected above the level of the reported sample reporting/quantitation limit

General Lab Comments

Per method recommendation (section 4.4), Samples analyzed by methods EPA 300.0 and EPA 300.1 have been filtered prior to analysis.

The following is an interpretation of the results from EPA method 9223B:
A result of zero (0) indicates absence for both coliform and Escherichia coli meaning the water meets the microbiological requirements of the U.S. EPA Safe Drinking Water Act (SDWA). A result of one (1) for either test indicates presence and the water does not meet the SDWA requirements. Waters with positive tests should be disinfected by a certified water treatment operator and retested.

Per federal regulation the holding time for the following parameters in aqueous/water samples is 15 minutes: Residual Chlorine, pH, Dissolved Oxygen, Sulfite.

Western Environmental Testing Laboratory
Analytical Report

Balance Hydrologics
800 Baucroft Ave. Suite 101
Berkeley, CA 94710
Attn: Brian Hastings
Phone: (510-704-1000 **Fax:**
PO\Project: *213136*

Date Printed: 2/15/2019
OrderID: *19020061*

Customer Sample ID: CC@CB
WETLAB Sample ID: 19020061-001
Collect Date/Time: 2/2/2019 09:00
Receive Date: 2/4/2019 16:30

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Orthophosphate, as P	SM 4500-P E	0.15	HT	mg/L	1	0.010	2/5/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.40		mg/L	1	0.010	2/6/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	99		mg/L	1	1.0	2/5/2019	NV00925
Total Nitrogen	Calc.	1.3		mg/L	1	0.22	2/12/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	1000		mg/L	1	10	2/6/2019	NV00925
Anions by Ion Chromatography								
Nitrate Nitrogen	EPA 300.0	0.47	HT	mg/L	1	0.010	2/5/2019	NV00925
Nitrite Nitrogen	EPA 300.0	0.015	HT	mg/L	1	0.010	2/5/2019	NV00925
Flow Injection Analyses								
Nitrate + Nitrite Nitrogen	EPA 353.2	0.57		mg/L	1	0.020	2/7/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.78	M	mg/L	0.5	0.20	2/12/2019	NV00925

Customer Sample ID: AC@TR
WETLAB Sample ID: 19020061-002
Collect Date/Time: 2/2/2019 09:50
Receive Date: 2/4/2019 16:30

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Orthophosphate, as P	SM 4500-P E	ND	HT	mg/L	1	0.010	2/5/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.34		mg/L	1	0.010	2/6/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	140		mg/L	1	1.0	2/5/2019	NV00925
Total Nitrogen	Calc.	0.76		mg/L	1	0.22	2/12/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	410		mg/L	1	10	2/6/2019	NV00925
Anions by Ion Chromatography								
Nitrate Nitrogen	EPA 300.0	0.033	HT	mg/L	1	0.010	2/5/2019	NV00925
Nitrite Nitrogen	EPA 300.0	ND	HT	mg/L	1	0.010	2/5/2019	NV00925
Flow Injection Analyses								
Nitrate + Nitrite Nitrogen	EPA 353.2	0.13		mg/L	1	0.020	2/7/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.73		mg/L	0.5	0.20	2/12/2019	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Customer Sample ID: WC@OVH | **Collect Date/Time:** 2/2/2019 11:45
WETLAB Sample ID: 19020061-003 | **Receive Date:** 2/4/2019 16:30

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.024 HT	mg/L	1	0.010	2/5/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.13	mg/L	1	0.010	2/6/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	44	mg/L	1	1.0	2/5/2019	NV00925
Total Nitrogen	Calc.	0.36	mg/L	1	0.22	2/12/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	68	mg/L	1	10	2/6/2019	NV00925
Anions by Ion Chromatography							
Nitrate Nitrogen	EPA 300.0	0.027 HT	mg/L	1	0.010	2/5/2019	NV00925
Nitrite Nitrogen	EPA 300.0	ND HT	mg/L	1	0.010	2/5/2019	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	0.065	mg/L	1	0.020	2/9/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.33	mg/L	0.5	0.20	2/12/2019	NV00925

Customer Sample ID: SBC@RHR | **Collect Date/Time:** 2/2/2019 12:00
WETLAB Sample ID: 19020061-004 | **Receive Date:** 2/4/2019 16:30

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.080 HT	mg/L	1	0.010	2/5/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.13	mg/L	1	0.010	2/6/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	71	mg/L	1	1.0	2/5/2019	NV00925
Total Nitrogen	Calc.	1.1	mg/L	1	0.22	2/12/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	180	mg/L	1	10	2/6/2019	NV00925
Anions by Ion Chromatography							
Nitrate Nitrogen	EPA 300.0	0.25 HT	mg/L	1	0.010	2/5/2019	NV00925
Nitrite Nitrogen	EPA 300.0	ND HT	mg/L	1	0.010	2/5/2019	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	0.31	mg/L	1	0.020	2/9/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.82	mg/L	0.5	0.20	2/12/2019	NV00925

Customer Sample ID: SBC@NAR | **Collect Date/Time:** 2/2/2019 12:40
WETLAB Sample ID: 19020061-005 | **Receive Date:** 2/4/2019 16:30

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.19 HT	mg/L	1	0.010	2/5/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.23	mg/L	1	0.010	2/6/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	180	mg/L	1	1.0	2/5/2019	NV00925
Total Nitrogen	Calc.	1.4	mg/L	1	0.22	2/12/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	540	mg/L	1	10	2/6/2019	NV00925
Anions by Ion Chromatography							
Nitrate Nitrogen	EPA 300.0	0.23 HT	mg/L	1	0.010	2/5/2019	NV00925
Nitrite Nitrogen	EPA 300.0	ND HT	mg/L	1	0.010	2/5/2019	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Customer Sample ID: SBC@NAR **Collect Date/Time:** 2/2/2019 12:40
WETLAB Sample ID: 19020061-005 **Receive Date:** 2/4/2019 16:30

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
Flow Injection Analyses								
Nitrate + Nitrite Nitrogen	EPA 353.2	0.29		mg/L	1	0.020	2/9/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	1.2		mg/L	0.5	0.20	2/12/2019	NV00925

Customer Sample ID: NTD@ORD **Collect Date/Time:** 2/2/2019 13:10
WETLAB Sample ID: 19020061-006 **Receive Date:** 2/4/2019 16:30

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Orthophosphate, as P	SM 4500-P E	0.13	HT	mg/L	1	0.010	2/5/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.17		mg/L	1	0.010	2/6/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	130		mg/L	1	1.0	2/5/2019	NV00925
Total Nitrogen	Calc.	1.9		mg/L	1	0.22	2/12/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	260		mg/L	1	10	2/6/2019	NV00925
Anions by Ion Chromatography								
Nitrate Nitrogen	EPA 300.0	0.62	HT	mg/L	1	0.010	2/5/2019	NV00925
Nitrite Nitrogen	EPA 300.0	0.012	HT	mg/L	1	0.010	2/5/2019	NV00925
Flow Injection Analyses								
Nitrate + Nitrite Nitrogen	EPA 353.2	0.70		mg/L	1	0.020	2/9/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	1.3		mg/L	0.5	0.20	2/12/2019	NV00925

Customer Sample ID: NTD@BFD(1) **Collect Date/Time:** 2/2/2019 04:00
WETLAB Sample ID: 19020061-007 **Receive Date:** 2/4/2019 16:30

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Orthophosphate, as P	SM 4500-P E	0.18	HT	mg/L	1	0.010	2/5/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.30		mg/L	1	0.010	2/6/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	27		mg/L	1	1.0	2/5/2019	NV00925
Total Nitrogen	Calc.	3.3		mg/L	1	0.24	2/12/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	730		mg/L	1	10	2/6/2019	NV00925
Anions by Ion Chromatography								
Nitrate Nitrogen	EPA 300.0	2.1	HT	mg/L	2	0.020	2/5/2019	NV00925
Nitrite Nitrogen	EPA 300.0	ND	D,HT	mg/L	2	0.020	2/5/2019	NV00925
Flow Injection Analyses								
Nitrate + Nitrite Nitrogen	EPA 353.2	2.3		mg/L	2	0.040	2/9/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	1.1		mg/L	0.5	0.20	2/12/2019	NV00925

Customer Sample ID: NTD@BDF(2) **Collect Date/Time:** 2/2/2019 11:30
WETLAB Sample ID: 19020061-008 **Receive Date:** 2/4/2019 16:30

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Orthophosphate, as P	SM 4500-P E	0.092	HT	mg/L	1	0.010	2/5/2019	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Customer Sample ID: NTD@BDF(2) **Collect Date/Time:** 2/2/2019 11:30

WETLAB Sample ID: 19020061-008 **Receive Date:** 2/4/2019 16:30

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
Total Phosphorous as P	SM 4500-P E	0.13	mg/L	1	0.010	2/6/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	140	mg/L	1	1.0	2/5/2019	NV00925
Total Nitrogen	Calc.	2.2	mg/L	1	0.22	2/12/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	280	mg/L	1	10	2/6/2019	NV00925
Anions by Ion Chromatography							
Nitrate Nitrogen	EPA 300.0	0.80 HT	mg/L	1	0.010	2/5/2019	NV00925
Nitrite Nitrogen	EPA 300.0	0.017 HT	mg/L	1	0.010	2/5/2019	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	0.88	mg/L	1	0.020	2/9/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	1.4	mg/L	0.5	0.20	2/12/2019	NV00925

Customer Sample ID: NTD@BFD(3) **Collect Date/Time:** 2/2/2019 14:15

WETLAB Sample ID: 19020061-009 **Receive Date:** 2/4/2019 16:30

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.091 HT	mg/L	1	0.010	2/5/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.11	mg/L	1	0.010	2/6/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	140	mg/L	1	1.0	2/5/2019	NV00925
Total Nitrogen	Calc.	1.6	mg/L	1	0.22	2/12/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	160	mg/L	1	10	2/6/2019	NV00925
Anions by Ion Chromatography							
Nitrate Nitrogen	EPA 300.0	0.43 HT	mg/L	1	0.010	2/5/2019	NV00925
Nitrite Nitrogen	EPA 300.0	0.020 HT	mg/L	1	0.010	2/5/2019	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	0.50	mg/L	1	0.020	2/9/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	1.1	mg/L	0.5	0.20	2/12/2019	NV00925

Customer Sample ID: NTD@BFD(4) **Collect Date/Time:** 2/2/2019 15:10

WETLAB Sample ID: 19020061-010 **Receive Date:** 2/4/2019 16:30

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.11 HT	mg/L	1	0.010	2/5/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.22	mg/L	1	0.010	2/6/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	160	mg/L	1	1.0	2/5/2019	NV00925
Total Nitrogen	Calc.	1.5	mg/L	1	0.22	2/12/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	160	mg/L	1	10	2/6/2019	NV00925
Anions by Ion Chromatography							
Nitrate Nitrogen	EPA 300.0	0.37 HT	mg/L	1	0.010	2/5/2019	NV00925
Nitrite Nitrogen	EPA 300.0	0.017 HT	mg/L	1	0.010	2/5/2019	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	0.44	mg/L	1	0.020	2/9/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	1.1	mg/L	0.5	0.20	2/12/2019	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Customer Sample ID: SBC@CWW(1) **Collect Date/Time:** 2/2/2019 06:00

WETLAB Sample ID: 19020061-011 **Receive Date:** 2/4/2019 16:30

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Orthophosphate, as P	SM 4500-P E	0.12	HT	mg/L	1	0.010	2/5/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.26		mg/L	1	0.010	2/6/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	52		mg/L	1	1.0	2/5/2019	NV00925
Total Nitrogen	Calc.	1.5		mg/L	1	0.22	2/12/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	450		mg/L	1	10	2/6/2019	NV00925
Anions by Ion Chromatography								
Nitrate Nitrogen	EPA 300.0	0.76	HT	mg/L	1	0.010	2/5/2019	NV00925
Nitrite Nitrogen	EPA 300.0	ND	HT	mg/L	1	0.010	2/5/2019	NV00925
Flow Injection Analyses								
Nitrate + Nitrite Nitrogen	EPA 353.2	0.85		mg/L	1	0.020	2/9/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.74	M	mg/L	0.5	0.20	2/12/2019	NV00925

Customer Sample ID: SBC@CWW(2) **Collect Date/Time:** 2/2/2019 13:00

WETLAB Sample ID: 19020061-012 **Receive Date:** 2/4/2019 16:30

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Orthophosphate, as P	SM 4500-P E	0.10	HT	mg/L	1	0.010	2/5/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.15		mg/L	1	0.010	2/6/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	98		mg/L	1	1.0	2/5/2019	NV00925
Total Nitrogen	Calc.	2.0		mg/L	1	0.22	2/12/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	420		mg/L	1	10	2/6/2019	NV00925
Anions by Ion Chromatography								
Nitrate Nitrogen	EPA 300.0	1.1	HT	mg/L	1	0.010	2/5/2019	NV00925
Nitrite Nitrogen	EPA 300.0	ND	M,HT	mg/L	1	0.010	2/5/2019	NV00925
Flow Injection Analyses								
Nitrate + Nitrite Nitrogen	EPA 353.2	1.2		mg/L	1	0.020	2/9/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.89		mg/L	0.5	0.20	2/12/2019	NV00925

Customer Sample ID: SBC@CWW(3) **Collect Date/Time:** 2/2/2019 15:00

WETLAB Sample ID: 19020061-013 **Receive Date:** 2/4/2019 16:30

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Orthophosphate, as P	SM 4500-P E	0.087	HT	mg/L	1	0.010	2/5/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.21		mg/L	1	0.010	2/6/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	110		mg/L	1	1.0	2/5/2019	NV00925
Total Nitrogen	Calc.	2.0		mg/L	1	0.22	2/12/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	360		mg/L	1	10	2/6/2019	NV00925
Anions by Ion Chromatography								
Nitrate Nitrogen	EPA 300.0	1.1	HT	mg/L	1	0.010	2/5/2019	NV00925
Nitrite Nitrogen	EPA 300.0	ND	HT	mg/L	1	0.010	2/5/2019	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Customer Sample ID: SBC@CWW(3) **Collect Date/Time:** 2/2/2019 15:00

WETLAB Sample ID: 19020061-013 **Receive Date:** 2/4/2019 16:30

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
Flow Injection Analyses								
Nitrate + Nitrite Nitrogen	EPA 353.2	1.2		mg/L	1	0.020	2/9/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.84		mg/L	0.5	0.20	2/12/2019	NV00925

Customer Sample ID: SBC@CWW(4) **Collect Date/Time:** 2/2/2019 17:20

WETLAB Sample ID: 19020061-014 **Receive Date:** 2/4/2019 16:30

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Orthophosphate, as P	SM 4500-P E	0.099	HT	mg/L	1	0.010	2/5/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.11		mg/L	1	0.010	2/6/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	80		mg/L	1	1.0	2/5/2019	NV00925
Total Nitrogen	Calc.	1.5		mg/L	1	0.22	2/12/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	320		mg/L	1	10	2/6/2019	NV00925
Anions by Ion Chromatography								
Nitrate Nitrogen	EPA 300.0	0.82	HT	mg/L	1	0.010	2/5/2019	NV00925
Nitrite Nitrogen	EPA 300.0	ND	HT	mg/L	1	0.010	2/5/2019	NV00925
Flow Injection Analyses								
Nitrate + Nitrite Nitrogen	EPA 353.2	0.90		mg/L	1	0.020	2/9/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.71		mg/L	0.5	0.20	2/12/2019	NV00925

Customer Sample ID: BS@SBC(1) **Collect Date/Time:** 2/2/2019 03:40

WETLAB Sample ID: 19020061-015 **Receive Date:** 2/4/2019 16:30

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Orthophosphate, as P	SM 4500-P E	0.090	HT	mg/L	1	0.010	2/5/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.16		mg/L	1	0.010	2/6/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	29		mg/L	1	1.0	2/5/2019	NV00925
Total Nitrogen	Calc.	2.1		mg/L	1	0.24	2/12/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	400		mg/L	1	10	2/6/2019	NV00925
Anions by Ion Chromatography								
Nitrate Nitrogen	EPA 300.0	1.5	HT	mg/L	2	0.020	2/5/2019	NV00925
Nitrite Nitrogen	EPA 300.0	ND	D,HT	mg/L	2	0.020	2/5/2019	NV00925
Flow Injection Analyses								
Nitrate + Nitrite Nitrogen	EPA 353.2	1.7		mg/L	1	0.020	2/9/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.51		mg/L	0.5	0.20	2/12/2019	NV00925

Customer Sample ID: BS@SBC(2) **Collect Date/Time:** 2/2/2019 07:00

WETLAB Sample ID: 19020061-016 **Receive Date:** 2/4/2019 16:30

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Orthophosphate, as P	SM 4500-P E	0.093	HT	mg/L	1	0.010	2/5/2019	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Customer Sample ID: BS@SBC(2) **Collect Date/Time:** 2/2/2019 07:00
WETLAB Sample ID: 19020061-016 **Receive Date:** 2/4/2019 16:30

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
Total Phosphorous as P	SM 4500-P E	0.17		mg/L	1	0.010	2/6/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	20		mg/L	1	1.0	2/5/2019	NV00925
Total Nitrogen	Calc.	2.0		mg/L	1	0.24	2/12/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	410		mg/L	1	10	2/6/2019	NV00925
Anions by Ion Chromatography								
Nitrate Nitrogen	EPA 300.0	1.6	HT	mg/L	2	0.020	2/5/2019	NV00925
Nitrite Nitrogen	EPA 300.0	ND	D,HT	mg/L	2	0.020	2/5/2019	NV00925
Flow Injection Analyses								
Nitrate + Nitrite Nitrogen	EPA 353.2	1.7		mg/L	1	0.020	2/9/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.49		mg/L	0.5	0.20	2/12/2019	NV00925

Customer Sample ID: BS@SBC(3) **Collect Date/Time:** 2/2/2019 12:20
WETLAB Sample ID: 19020061-017 **Receive Date:** 2/4/2019 16:30

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Orthophosphate, as P	SM 4500-P E	0.084	HT	mg/L	1	0.010	2/5/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.12		mg/L	1	0.010	2/6/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	86		mg/L	1	1.0	2/5/2019	NV00925
Total Nitrogen	Calc.	2.1		mg/L	1	0.22	2/12/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	260		mg/L	1	10	2/6/2019	NV00925
Anions by Ion Chromatography								
Nitrate Nitrogen	EPA 300.0	1.1	HT	mg/L	1	0.010	2/5/2019	NV00925
Nitrite Nitrogen	EPA 300.0	ND	HT	mg/L	1	0.010	2/5/2019	NV00925
Flow Injection Analyses								
Nitrate + Nitrite Nitrogen	EPA 353.2	1.1		mg/L	1	0.020	2/9/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.93		mg/L	0.5	0.20	2/12/2019	NV00925

Customer Sample ID: BS@SBC(4) **Collect Date/Time:** 2/2/2019 15:00
WETLAB Sample ID: 19020061-018 **Receive Date:** 2/4/2019 16:30

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Orthophosphate, as P	SM 4500-P E	0.090	HT	mg/L	1	0.010	2/5/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.11		mg/L	1	0.010	2/6/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	110		mg/L	1	1.0	2/5/2019	NV00925
Total Nitrogen	Calc.	1.3		mg/L	1	0.22	2/12/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	120		mg/L	1	10	2/6/2019	NV00925
Anions by Ion Chromatography								
Nitrate Nitrogen	EPA 300.0	0.53	HT	mg/L	1	0.010	2/5/2019	NV00925
Nitrite Nitrogen	EPA 300.0	0.020	HT	mg/L	1	0.010	2/5/2019	NV00925
Flow Injection Analyses								
Nitrate + Nitrite Nitrogen	EPA 353.2	0.60		mg/L	1	0.020	2/9/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.79		mg/L	0.5	0.20	2/12/2019	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Customer Sample ID: YD@SBC(1) **Collect Date/Time:** 2/2/2019 03:00

WETLAB Sample ID: 19020061-019 **Receive Date:** 2/4/2019 16:30

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.11 HT	mg/L	1	0.010	2/5/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.18	mg/L	1	0.010	2/7/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	29	mg/L	1	1.0	2/5/2019	NV00925
Total Nitrogen	Calc.	2.3	mg/L	1	0.24	2/12/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	400	mg/L	1	10	2/6/2019	NV00925
Anions by Ion Chromatography							
Nitrate Nitrogen	EPA 300.0	1.6 HT	mg/L	2	0.020	2/5/2019	NV00925
Nitrite Nitrogen	EPA 300.0	0.028 HT	mg/L	2	0.020	2/5/2019	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	1.8	mg/L	1	0.020	2/9/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.72	mg/L	0.5	0.20	2/12/2019	NV00925

Customer Sample ID: YD@SBC(2) **Collect Date/Time:** 2/2/2019 06:45

WETLAB Sample ID: 19020061-020 **Receive Date:** 2/4/2019 16:30

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.078 HT	mg/L	1	0.010	2/5/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.11	mg/L	1	0.010	2/7/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	36	mg/L	1	1.0	2/5/2019	NV00925
Total Nitrogen	Calc.	2.7	mg/L	1	0.24	2/12/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	380	mg/L	1	10	2/6/2019	NV00925
Anions by Ion Chromatography							
Nitrate Nitrogen	EPA 300.0	1.9 HT	mg/L	2	0.020	2/5/2019	NV00925
Nitrite Nitrogen	EPA 300.0	0.032 HT	mg/L	2	0.020	2/5/2019	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	2.1	mg/L	2	0.040	2/9/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.70	mg/L	0.5	0.20	2/12/2019	NV00925

Customer Sample ID: YD@SBC(3) **Collect Date/Time:** 2/2/2019 14:15

WETLAB Sample ID: 19020061-021 **Receive Date:** 2/4/2019 16:30

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.082 HT	mg/L	1	0.010	2/5/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.11 M	mg/L	1	0.010	2/6/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	87	mg/L	1	1.0	2/5/2019	NV00925
Total Nitrogen	Calc.	2.3	mg/L	1	0.24	2/12/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	260	mg/L	1	10	2/6/2019	NV00925
Anions by Ion Chromatography							
Nitrate Nitrogen	EPA 300.0	1.3 HT	mg/L	2	0.020	2/5/2019	NV00925
Nitrite Nitrogen	EPA 300.0	0.040 HT	mg/L	2	0.020	2/5/2019	NV00925

Customer Sample ID: YD@SBC(3) **Collect Date/Time:** 2/2/2019 14:15

WETLAB Sample ID: 19020061-021 **Receive Date:** 2/4/2019 16:30

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	1.4	mg/L	1	0.020	2/9/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.96	mg/L	0.5	0.20	2/12/2019	NV00925

Customer Sample ID: YD@SBC(4) **Collect Date/Time:** 2/2/2019 16:30

WETLAB Sample ID: 19020061-022 **Receive Date:** 2/4/2019 16:30

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.073 HT	mg/L	1	0.010	2/5/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.33 M	mg/L	1	0.010	2/6/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	31	mg/L	1	1.0	2/5/2019	NV00925
Total Nitrogen	Calc.	2.0	mg/L	1	0.24	2/12/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	270	mg/L	1	10	2/6/2019	NV00925
Anions by Ion Chromatography							
Nitrate Nitrogen	EPA 300.0	1.4 HT	mg/L	2	0.020	2/5/2019	NV00925
Nitrite Nitrogen	EPA 300.0	0.038 HT	mg/L	2	0.020	2/5/2019	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	1.6	mg/L	1	0.020	2/9/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.64	mg/L	0.5	0.20	2/12/2019	NV00925

Western Environmental Testing Laboratory
QC Report

QCBatchID	QCType	Parameter	Method	Result	Actual	% Rec	Units
QC19020103	Blank 1	Orthophosphate, as P	SM 4500-P E	ND			mg/L
QC19020103	Blank 2	Orthophosphate, as P	SM 4500-P E	ND			mg/L
QC19020142	Blank 1	Nitrate Nitrogen	EPA 300.0	ND			mg/L
		Nitrite Nitrogen	EPA 300.0	ND			mg/L
QC19020143	Blank 1	Nitrate Nitrogen	EPA 300.0	ND			mg/L
		Nitrite Nitrogen	EPA 300.0	ND			mg/L
QC19020173	Blank 1	Total Suspended Solids (TSS)	SM 2540D	ND			mg/L
QC19020174	Blank 1	Total Suspended Solids (TSS)	SM 2540D	ND			mg/L
QC19020176	Blank 1	Total Phosphorous as P	SM 4500-P E	ND			mg/L
QC19020177	Blank 1	Total Phosphorous as P	SM 4500-P E	ND			mg/L
QC19020206	Blank 1	Nitrate + Nitrite Nitrogen	EPA 353.2	ND			mg/L
QC19020218	Blank 1	Total Phosphorous as P	SM 4500-P E	ND			mg/L
QC19020278	Blank 1	Total Dissolved Solids (TDS)	SM 2540C	ND			mg/L
QC19020279	Blank 1	Total Dissolved Solids (TDS)	SM 2540C	ND			mg/L
QC19020299	Blank 1	Nitrate + Nitrite Nitrogen	EPA 353.2	ND			mg/L
QC19020348	Blank 1	Nitrate + Nitrite Nitrogen	EPA 353.2	ND			mg/L
QC19020389	Blank 1	Total Kjeldahl Nitrogen	EPA 351.2	ND			mg/L
QC19020396	Blank 1	Total Kjeldahl Nitrogen	EPA 351.2	ND			mg/L

QCBatchID	QCType	Parameter	Method	Result	Actual	% Rec	Units
QC19020103	LCS 1	Orthophosphate, as P	SM 4500-P E	0.253	0.250	101	mg/L
QC19020103	LCS 2	Orthophosphate, as P	SM 4500-P E	0.256	0.250	103	mg/L
QC19020142	LCS 1	Nitrate Nitrogen	EPA 300.0	0.478	0.500	96	mg/L
		Nitrite Nitrogen	EPA 300.0	0.495	0.500	99	mg/L
QC19020143	LCS 1	Nitrate Nitrogen	EPA 300.0	0.478	0.500	96	mg/L
		Nitrite Nitrogen	EPA 300.0	0.495	0.500	99	mg/L
QC19020173	LCS 1	Total Suspended Solids (TSS)	SM 2540D	199	200	99	mg/L
QC19020173	LCS 2	Total Suspended Solids (TSS)	SM 2540D	200	200	100	mg/L
QC19020174	LCS 1	Total Suspended Solids (TSS)	SM 2540D	198	200	99	mg/L
QC19020174	LCS 2	Total Suspended Solids (TSS)	SM 2540D	200	200	100	mg/L
QC19020176	LCS 1	Total Phosphorous as P	SM 4500-P E	0.276	0.250	110	mg/L
QC19020177	LCS 1	Total Phosphorous as P	SM 4500-P E	0.274	0.250	110	mg/L
QC19020206	LCS 1	Nitrate + Nitrite Nitrogen	EPA 353.2	0.841	0.800	105	mg/L
QC19020218	LCS 1	Total Phosphorous as P	SM 4500-P E	0.261	0.250	104	mg/L
QC19020278	LCS 1	Total Dissolved Solids (TDS)	SM 2540C	142	150	95	mg/L
QC19020278	LCS 2	Total Dissolved Solids (TDS)	SM 2540C	151	150	101	mg/L
QC19020279	LCS 1	Total Dissolved Solids (TDS)	SM 2540C	147	150	98	mg/L
QC19020279	LCS 2	Total Dissolved Solids (TDS)	SM 2540C	151	150	101	mg/L
QC19020299	LCS 1	Nitrate + Nitrite Nitrogen	EPA 353.2	0.837	0.800	105	mg/L
QC19020348	LCS 1	Nitrate + Nitrite Nitrogen	EPA 353.2	0.833	0.800	104	mg/L
QC19020389	LCS 1	Total Kjeldahl Nitrogen	EPA 351.2	0.965	1.00	96	mg/L
QC19020396	LCS 1	Total Kjeldahl Nitrogen	EPA 351.2	1.03	1.00	103	mg/L

QCBatchID	QCType	Parameter	Method	Duplicate Sample	Sample Result	Duplicate Result	Units	RPD
QC19020173	Duplicate 1	Total Suspended Solids (TSS)	SM 2540D	19020023-00	ND	ND	mg/L	<1%
QC19020173	Duplicate 2	Total Suspended Solids (TSS)	SM 2540D	19020061-00	132	138	mg/L	4 %
QC19020174	Duplicate 1	Total Suspended Solids (TSS)	SM 2540D	19020061-00	144	140	mg/L	3 %

QCBatchID	QCType	Parameter	Method	Duplicate Sample	Sample Result	Duplicate Result		Units	RPD
QC19020174	Duplicate 2	Total Suspended Solids (TSS)	SM 2540D	19020074-00	16660	16660		mg/L	<1%
QC19020278	Duplicate 1	Total Dissolved Solids (TDS)	SM 2540C	19020006-00	1177	1157		mg/L	2 %
QC19020278	Duplicate 2	Total Dissolved Solids (TDS)	SM 2540C	19020061-00	732	768		mg/L	5 %
QC19020279	Duplicate 1	Total Dissolved Solids (TDS)	SM 2540C	19020061-00	1008	988		mg/L	2 %
QC19020279	Duplicate 2	Total Dissolved Solids (TDS)	SM 2540C	19020100-00	532	475	QD	mg/L	11 %

QCBatchID	QCType	Parameter	Method	Spike Sample	Sample Result		MS Result	MSD Result	Spike Value	Units	MS %Rec	MSD %Rec	RPD %
QC19020103	MS 1	Orthophosphate, as P	SM 4500-P E	19020061-001	0.148	HT	0.396	0.400	0.25	mg/L	99	101	1
QC19020103	MS 2	Orthophosphate, as P	SM 4500-P E	19020061-011	0.124	HT	0.378	0.378	0.25	mg/L	102	102	<1
QC19020103	MS 3	Orthophosphate, as P	SM 4500-P E	19020061-021	0.082	HT	0.328	0.333	0.25	mg/L	98	100	2
QC19020142	MS 1	Nitrate Nitrogen	EPA 300.0	19020061-010	0.368	HT	0.874	0.893	0.5	mg/L	101	105	2
		Nitrite Nitrogen	EPA 300.0	19020061-010	0.017	HT	0.141	0.147	0.125	mg/L	99	104	4
QC19020142	MS 2	Nitrate Nitrogen	EPA 300.0	19020061-012	1.09	HT	1.57	1.59	0.5	mg/L	97	101	1
		Nitrite Nitrogen	EPA 300.0	19020061-012	ND	M,	0.097	0.103	0.125	mg/L	NC	NC	NC
QC19020143	MS 1	Nitrate Nitrogen	EPA 300.0	19020061-022	1.35	HT	2.43	2.36	0.5	mg/L	107	101	3
		Nitrite Nitrogen	EPA 300.0	19020061-022	0.038	HT	0.266	0.265	0.125	mg/L	91	91	<1
QC19020176	MS 1	Total Phosphorous as P	SM 4500-P E	19020061-021	0.113	M	0.293	0.267	0.25	mg/L	NC	NC	NC
QC19020176	MS 2	Total Phosphorous as P	SM 4500-P E	19020061-022	0.327	M	0.414	0.419	0.25	mg/L	NC	NC	NC
QC19020177	MS 1	Total Phosphorous as P	SM 4500-P E	19020061-001	0.399		0.697	0.682	0.25	mg/L	119	113	2
QC19020177	MS 2	Total Phosphorous as P	SM 4500-P E	19020061-011	0.257		0.555	0.556	0.25	mg/L	119	119	<1
QC19020206	MS 1	Nitrate + Nitrite Nitrogen	EPA 353.2	19010813-003	ND		5.23	5.51	1	mg/L	103	108	5
QC19020206	MS 2	Nitrate + Nitrite Nitrogen	EPA 353.2	19020059-001	0.624		5.81	6.08	1	mg/L	104	109	4
QC19020218	MS 1	Total Phosphorous as P	SM 4500-P E	19020061-019	0.180		0.465	0.487	0.25	mg/L	114	123	5
QC19020218	MS 2	Total Phosphorous as P	SM 4500-P E	19020144-002	0.422	M	0.772	0.713	0.25	mg/L	NC	NC	NC
QC19020299	MS 1	Nitrate + Nitrite Nitrogen	EPA 353.2	19020061-021	1.45		2.45	2.44	1	mg/L	100	100	<1
QC19020299	MS 2	Nitrate + Nitrite Nitrogen	EPA 353.2	19020144-001	1.26		2.23	2.27	1	mg/L	97	101	2
QC19020348	MS 1	Nitrate + Nitrite Nitrogen	EPA 353.2	19010699-003	3.88		9.00	8.94	1	mg/L	102	101	<1
QC19020348	MS 2	Nitrate + Nitrite Nitrogen	EPA 353.2	19020061-011	0.849		1.85	1.87	1	mg/L	100	102	1
QC19020389	MS 1	Total Kjeldahl Nitrogen	EPA 351.2	19020061-001	0.780	M	1.22	1.18	0.5	mg/L	NC	NC	NC
QC19020389	MS 2	Total Kjeldahl Nitrogen	EPA 351.2	19020061-011	0.740	M	1.14	1.16	0.5	mg/L	NC	NC	NC
QC19020396	MS 1	Total Kjeldahl Nitrogen	EPA 351.2	19020061-021	0.960		1.42	1.40	0.5	mg/L	93	88	1

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tel (775) 777-9933 | fax (775) 777-9933
3230 Polaris Ave., Suite 4 | Las Vegas, Nevada 89102
tel (702) 475-8899 | fax (702) 776-6152

WETLAB Order ID. 19020061
Sparks Control #
Elko Control #
LV Control #
Report Due Date
Page 1 of 3

Client Balance Hydrologics
Address 12020 Donner Pass Rd. Suite B1
City, State & Zip Truckee, CA 96161
Contact Brian Hastings
Phone 530-550-9776
Collector's Name BKH
Fax
PWS/Project Name
P.O. Number
PWS/Project Number 213136
Email bhastings@balancehydro.com

Turnaround Time Requirements
Standard ☑
5 Day* (25%) ☐ 72 Hour* (50%) ☐
48 Hour* (100%) ☐ 24 Hour* (200%) ☐
*Surcharges Will Apply

Samples Collected From Which State?
NV ☑ CA ☐ Other ☐

Compliance Monitoring?
Yes ☐ No ☑

Report to Regulatory Agency?
Yes ☐ No ☑

Report Results Via
PDF ☑ EDD ☐
Other

Standard QC Required?
Yes ☑ No ☐

Billing Address (if different than Client Address)
Company Balance Hydrologics
Address 800 Bancroft Way Suite 101
City, State & Zip Berkeley, CA 94710
Contact Rachel Boitano
Phone 510-704-1000 Fax
Email bhastings@balancehydro.com

Analyses Requested

SAMPLE ID/LOCATION	DATE	TIME	PRES TYPE *	SAMPLE TYPE **	NO. OF CONTAINERS	Total N	Total P	Nitrate	Ortho P	TDS	TSS					Spl. No.
CC@CB	2/2/19	9:00		aq	2	✓	✓	✓	✓	✓	✓					1
AC@TR	2/2/19	9:50		aq	2	✓	✓	✓	✓	✓	✓					2
WC@OVH	2/2/19	11:45		aq	2	✓	✓	✓	✓	✓	✓					3
SBC@RHR	2/2/19	12:00		aq	2	✓	✓	✓	✓	✓	✓					4
SBC@NAR	2/2/19	12:40		aq	2	✓	✓	✓	✓	✓	✓					5
NTD@ORD	2/2/19	13:10		aq	2	✓	✓	✓	✓	✓	✓					6

1902 2
0061 22

Instructions/Comments/Special Requirements: DUE TO Hold time, please Analyze NO_2 & NO_3 via both IC & Cachat. [illegible] 2/4/19 per phone call w/ Ben

Sample Matrix Key** DW = Drinking Water WW = Wastewater SW = Surface Water MW = Monitoring Well SD = Solid/Sludge SO = Soil HW = Hazardous Waste OTHER:

***SAMPLE PRESERVATIVES:** 1=Unpreserved 2=H2SO4 3=NaOH 4=HCl 5=HNO3 6=Na2S2O3 7=ZnOAc+NaOH 8=HCl/VOA Vial

Temp	Custody Seal	# of Containers	DATE	TIME	Samples Relinquished By	Samples Received By
5.3°C	Y N [✓ None]		2/4/19	1630		
°C	Y N None					
°C	Y N None					
°C	Y N None					

WETLAB'S Standard Terms and Conditions apply unless written agreements specify otherwise. Payment terms are Net 30.

Client/Collector attests to the validity and authenticity of this (these) sample(s) and, is (are) aware that tampering with or intentionally mislabeling the sample(s) location, date or time of collection may be considered fraud and subject to legal action (NAC445.0636). ________ initial
To the maximum extent permitted by law, the Client agrees to limit the liability of WETLAB for the Client's damages to the total compensation received, unless other agreements are made in writing. This limitation shall apply regardless of the cause of action or legal theory pled or asserted. ________ initial
WETLAB will dispose of samples 90 days from sample receipt. Client may request a longer sample storage time for an additional fee. Please contact your Project Manager for details. ________ initial

301.2E

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tel (775) 777-9933 | fax (775) 777-9933
3230 Polaris Ave., Suite 4 | Las Vegas, Nevada 89102
tel (702) 475-8899 | fax (702) 776-6152

WETLAB Order ID. 19020061
Sparks Control #
Elko Control #
LV Control #
Report Due Date
Page 2 of 3

Client Balance Hydrologics
Address 12020 Donner Pass Rd. Suite B1
City, State & Zip Truckee, CA 96161
Contact Brian Hastings
Phone 530-550-9776
Collector's Name BKH
Fax
PWS/Project Name
P.O. Number
PWS/Project Number 213136
Email bhastings@balancehydro.com

Turnaround Time Requirements
Standard ☑
5 Day* (25%) ☐ 72 Hour* (50%) ☐
48 Hour* (100%) ☐ 24 Hour* (200%) ☐
*Surcharges Will Apply

Samples Collected From Which State?
NV ☑ CA ☐ Other ☐

Compliance Monitoring?
Yes ☐ No ☑

Report to Regulatory Agency?
Yes ☐ No ☑

Report Results Via
PDF ☑ EDD ☐
Other

Standard QC Required?
Yes ☑ No ☐

Billing Address (if different than Client Address)
Company Balance Hydrologics
Address 800 Bancroft Way Suite 101
City, State & Zip Berkeley, CA 94710
Contact Rachel Boitano
Phone 510-704-1000 Fax
Email bhastings@balancehydro.com

Analyses Requested

SAMPLE ID/LOCATION	DATE	TIME	PRES TYPE *	SAMPLE TYPE **	NO. OF CONTAINERS	Total N	Total P	Nitrate	Ortho P	TDS	TSS					Spl. No.
NTD@BFD(1)	2/2/19	4:00		aq	2	✓	✓	✓	✓	✓	✓					7
NTD@BFD(2)	2/2/19	11:30		aq	2	✓	✓	✓	✓	✓	✓					8
NTD@BFD(3)	2/2/19	14:15		aq	2	✓	✓	✓	✓	✓	✓					9
NTD@BFD(4)	2/2/19	15:10		aq	2	✓	✓	✓	✓	✓	✓					10
SBC@CWW(1)	2/2/19	6:00		aq	2	✓	✓	✓	✓	✓	✓					11
SBC@CWW(2)	2/2/19	13:00		aq	2	✓	✓	✓	✓	✓	✓					12
SBC@CWW(3)	2/2/19	15:00		aq	2	✓	✓	✓	✓	✓	✓					13
SBC@CWW(4)	2/2/19	17:20		aq	2	✓	✓	✓	✓	✓	✓					14

1902 2
0061 22

Instructions/Comments/Special Requirements:

Sample Matrix Key** DW = Drinking Water WW = Wastewater SW = Surface Water MW = Monitoring Well SD = Solid/Sludge SO = Soil HW = Hazardous Waste OTHER:

***SAMPLE PRESERVATIVES:** 1=Unpreserved 2=H2SO4 3=NaOH 4=HCl 5=HNO3 6=Na2S2O3 7=ZnOAc+NaOH 8=HCl/VOA Vial

Temp	Custody Seal	# of Containers	DATE	TIME	Samples Relinquished By	Samples Received By
5.3°C	Y N [✓ None]		2/4/19	1631		
°C	Y N None					
°C	Y N None					
°C	Y N None					

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WETLAB will dispose of samples 90 days from sample receipt. Client may request a longer sample storage time for an additional fee. Please contact your Project Manager for details. ________ initial

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tel (775) 777-9933 | fax (775) 777-9933
3230 Polaris Ave., Suite 4 | Las Vegas, Nevada 89102
tel (702) 475-8899 | fax (702) 776-6152

WETLAB Order ID. ______
Sparks Control # ______
Elko Control # ______
LV Control # ______
Report Due Date
Page 3 of 3

Client Balance Hydrologics
Address 12020 Donner Pass Rd. Suite B1
City, State & Zip Truckee, CA 96161
Contact Brian Hastings
Phone 530-550-9776 Collector's Name BKH
Fax PWS/Project Name
P.O. Number PWS/Project Number 213136
Email bhastings@balancehydro.com

Turnaround Time Requirements
Standard ☑
5 Day* (25%) ☐ 72 Hour* (50%) ☐
48 Hour* (100%) ☐ 24 Hour* (200%) ☐
*Surcharges Will Apply

Samples Collected From Which State?
NV ☑ CA ☐ Other ☐

Report Results Via
PDF ☑ EDD ☐
Other ______

Compliance Monitoring?
Yes ☐ No ☑

Report to Regulatory Agency?
Yes ☐ No ☑

Standard QC Required?
Yes ☑ No ☐

Billing Address (if different than Client Address)
Company Balance Hydrologics
Address 800 Bancroft Way Suite 101
City, State & Zip Berkeley, CA 94710
Contact Rachel Boitano
Phone 510-704-1000 Fax ______
Email bhastings@balancehydro.com

Analyses Requested

SAMPLE ID/LOCATION	DATE	TIME	PRES TYPE *	SAMPLE TYPE **	NO. OF CONTAINERS	Total N	Total P	Nitrate	Ortho P	TDS	TSS					Spl. No.
BS@SBC(1)	2/2/19	3:40		aq	2	✓	✓	✓	✓	✓	✓					15
BS@SBC(2)	2/2/19	7:00		aq	2	✓	✓	✓	✓	✓	✓					16
BS@SBC(3)	2/2/19	12:20		aq	2	✓	✓	✓	✓	✓	✓					17
BS@SBC(4)	2/2/19	15:00		aq	2	✓	✓	✓	✓	✓	✓					18
YD@SBC(1)	2/2/19	3:00		aq	2	✓	✓	✓	✓	✓	✓					19
YD@SBC(2)	2/2/19	6:45		aq	2	✓	✓	✓	✓	✓	✓					20
YD@SBC(3)	2/2/19	14:15		aq	2	✓	✓	✓	✓	✓	✓					21
YD@SBC(4)	2/2/19	16:30		aq	2	✓	✓	✓	✓	✓	✓					22

1902 2

Instructions/Comments/Special Requirements:

0061 22

Sample Matrix Key** DW = Drinking Water WW = Wastewater SW = Surface Water MW = Monitoring Well SD = Solid/Sludge SO = Soil HW = Hazardous Waste OTHER: ______

***SAMPLE PRESERVATIVES:** 1=Unpreserved 2=H2SO4 3=NaOH 4=HCl 5=HNO3 6=Na2S2O3 7=ZnOAc+NaOH 8=HCl/VOA Vial

Temp	Custody Seal	# of Containers	DATE	TIME	Samples Relinquished By	Samples Received By
53°C	Y N [✓ None]		2/4/19	1631		
°C	Y N None					
°C	Y N None					
°C	Y N None					

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Client/Collector attests to the validity and authenticity of this (these) sample(s) and, is (are) aware that tampering with or intentionally mislabeling the sample(s) location, date or time of collection may be considered fraud and subject to legal action (NAC445.0636). ______ initial

To the maximum extent permitted by law, the Client agrees to limit the liability of WETLAB for the Client's damages to the total compensation received, unless other agreements are made in writing. This limitation shall apply regardless of the cause of action or legal theory pled or asserted. ______ initial

WETLAB will dispose of samples 90 days from sample receipt. Client may request a longer sample storage time for an additional fee. Please contact your Project Manager for details. ______ initial

301.2E

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www.WETLaboratory.com

Specializing in Soil, Hazardous Waste and Water Analysis

3/29/2019

Balance Hydrologics
800 Baucroft Ave. Suite 101
Berkeley, CA 94710
Attn: Brian Hastings

OrderID: *19030529*

Dear: Brian Hastings

This is to transmit the attached analytical report. The analytical data and information contained therein was generated using specified or selected methods contained in references, such as Standard Methods for the Examination of Water and Wastewater, online edition, Methods for Determination of Organic Compounds in Drinking Water, EPA-600/4-79-020, and Test Methods for Evaluation of Solid Waste, Physical/Chemical Methods (SW846) Third Edition.

The samples were received by WETLAB-Western Environmental Testing Laboratory in good condition on 3/19/2019. Additional comments are located on page 2 of this report.

If you should have any questions or comments regarding this report, please do not hesitate to call.

Sincerely,

Andy Smith
QA Manager

Western Environmental Testing Laboratory
Report Comments

Balance Hydrologics - 19030529

Specific Report Comments

None

Report Legend

B -- Blank contamination; Analyte detected above the method reporting limit in an associated blank

D -- Due to the sample matrix dilution was required in order to properly detect and report the analyte. The reporting limit has been adjusted accordingly.

HT -- Sample analyzed beyond the accepted holding time

J -- The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit

M -- The matrix spike/matrix spike duplicate (MS/MSD) values for the analysis of this parameter were outside acceptance criteria due to probable matrix interference. The reported result should be considered an estimate.

N -- There was insufficient sample available to perform a spike and/or duplicate on this analytical batch.

NC -- Not calculated due to matrix interference

QD -- The sample duplicate or matrix spike duplicate analysis demonstrated sample imprecision. The reported result should be considered an estimate.

QL -- The result for the laboratory control sample (LCS) was outside WETLAB acceptance criteria and reanalysis was not possible. The reported data should be considered an estimate.

S -- Surrogate recovery was outside of laboratory acceptance limits due to matrix interference. The associated blank and LCS surrogate recovery was within acceptance limits

SC -- Spike recovery not calculated. Sample concentration >4X the spike amount; therefore, the spike could not be adequately recovered

U -- The analyte was analyzed for, but was not detected above the level of the reported sample reporting/quantitation limit

General Lab Comments

Per method recommendation (section 4.4), Samples analyzed by methods EPA 300.0 and EPA 300.1 have been filtered prior to analysis.

The following is an interpretation of the results from EPA method 9223B:
A result of zero (0) indicates absence for both coliform and Escherichia coli meaning the water meets the microbiological requirements of the U.S. EPA Safe Drinking Water Act (SDWA). A result of one (1) for either test indicates presence and the water does not meet the SDWA requirements. Waters with positive tests should be disinfected by a certified water treatment operator and retested.

Per federal regulation the holding time for the following parameters in aqueous/water samples is 15 minutes: Residual Chlorine, pH, Dissolved Oxygen, Sulfite.

Western Environmental Testing Laboratory
Analytical Report

Balance Hydrologics		**Date Printed:**	3/29/2019
800 Baucroft Ave. Suite 101		**OrderID:**	*19030529*

Berkeley, CA 94710

Attn: Brian Hastings

Phone: (510-704-1000 **Fax:**

Customer Sample ID: AC @ TR **Collect Date/Time:** 3/19/2019 09:05

WETLAB Sample ID: 19030529-001 **Receive Date:** 3/19/2019 17:00

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Orthophosphate, as P	SM 4500-P E	ND		mg/L	1	0.020	3/20/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.034	QD	mg/L	1	0.020	3/21/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	35		mg/L	1	1.0	3/20/2019	NV00925
Total Nitrogen	Calc.	0.32		mg/L	1	0.22	3/28/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	460		mg/L	1	10	3/21/2019	NV00925
Microbiological Analyses								
Total Coliform (MPN)	SM 9223B (Quantitray)	579.4		MPN/100ml	1	1.0	3/19/2019	NV00925
Escherichia Coli (MPN)	SM 9223B (Quantitray)	6.3		MPN/100ml	1	1.0	3/19/2019	NV00925
Anions by Ion Chromatography								
Nitrate Nitrogen	EPA 300.0	ND		mg/L	1	0.030	3/20/2019	NV00925
Flow Injection Analyses								
Nitrate + Nitrite Nitrogen	EPA 353.2	0.060		mg/L	1	0.020	3/28/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.26		mg/L	0.5	0.20	3/26/2019	NV00925

Customer Sample ID: BS @ SBC (1) **Collect Date/Time:** 3/18/2019 13:00

WETLAB Sample ID: 19030529-002 **Receive Date:** 3/19/2019 17:00

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.067	mg/L	1	0.020	3/20/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.14	mg/L	1	0.020	3/21/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	66	mg/L	1	1.0	3/20/2019	NV00925
Total Nitrogen	Calc.	1.8	mg/L	1	0.22	3/28/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	230	mg/L	1	10	3/21/2019	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	1.0	mg/L	1	0.020	3/28/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.74	mg/L	0.5	0.20	3/26/2019	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Customer Sample ID: BS @ SBC (2) **Collect Date/Time:** 3/18/2019 19:00

WETLAB Sample ID: 19030529-003 **Receive Date:** 3/19/2019 17:00

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.055	mg/L	1	0.020	3/20/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.10	mg/L	1	0.020	3/21/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	28	mg/L	1	1.0	3/20/2019	NV00925
Total Nitrogen	Calc.	1.5	mg/L	1	0.22	3/28/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	250	mg/L	1	10	3/21/2019	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	1.0	mg/L	1	0.020	3/28/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.55	mg/L	0.5	0.20	3/26/2019	NV00925

Customer Sample ID: BS @ SBC (3) **Collect Date/Time:** 3/19/2019 01:00

WETLAB Sample ID: 19030529-004 **Receive Date:** 3/19/2019 17:00

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.077	mg/L	1	0.020	3/20/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.12	mg/L	1	0.020	3/21/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	32	mg/L	1	1.0	3/20/2019	NV00925
Total Nitrogen	Calc.	1.4	mg/L	1	0.22	3/28/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	240	mg/L	1	10	3/21/2019	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	0.92	mg/L	1	0.020	3/28/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.50	mg/L	0.5	0.20	3/26/2019	NV00925

Customer Sample ID: BS @ SBC (4) **Collect Date/Time:** 3/19/2019 07:00

WETLAB Sample ID: 19030529-005 **Receive Date:** 3/19/2019 17:00

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.067	mg/L	1	0.020	3/20/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.11	mg/L	1	0.020	3/21/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	26	mg/L	1	1.0	3/20/2019	NV00925
Total Nitrogen	Calc.	1.5	mg/L	1	0.22	3/28/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	250	mg/L	1	10	3/21/2019	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	0.96	mg/L	1	0.020	3/28/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.52	mg/L	0.5	0.20	3/26/2019	NV00925

Customer Sample ID: YD @ SBC (1) **Collect Date/Time:** 3/18/2019 14:00

WETLAB Sample ID: 19030529-006 **Receive Date:** 3/19/2019 17:00

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.086	mg/L	1	0.020	3/20/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.12	mg/L	1	0.020	3/21/2019	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Customer Sample ID: YD @ SBC (1) **Collect Date/Time:** 3/18/2019 14:00

WETLAB Sample ID: 19030529-006 **Receive Date:** 3/19/2019 17:00

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
Total Suspended Solids (TSS)	SM 2540D	31	mg/L	1	1.0	3/20/2019	NV00925
Total Nitrogen	Calc.	3.0	mg/L	1	0.24	3/28/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	360	mg/L	1	10	3/21/2019	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	2.1	mg/L	2	0.040	3/28/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.90	mg/L	0.5	0.20	3/26/2019	NV00925

Customer Sample ID: YD @ SBC (2) **Collect Date/Time:** 3/18/2019 20:00

WETLAB Sample ID: 19030529-007 **Receive Date:** 3/19/2019 17:00

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.076	mg/L	1	0.020	3/20/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.089	mg/L	1	0.020	3/21/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	19	mg/L	1	1.0	3/20/2019	NV00925
Total Nitrogen	Calc.	2.8	mg/L	1	0.24	3/28/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	400	mg/L	1	10	3/21/2019	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	2.1	mg/L	2	0.040	3/28/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.63	mg/L	0.5	0.20	3/26/2019	NV00925

Customer Sample ID: YD @ SBC (3) **Collect Date/Time:** 3/19/2019 02:00

WETLAB Sample ID: 19030529-008 **Receive Date:** 3/19/2019 17:00

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.090	mg/L	1	0.020	3/20/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.081	mg/L	1	0.020	3/21/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	19	mg/L	1	1.0	3/20/2019	NV00925
Total Nitrogen	Calc.	2.7	mg/L	1	0.24	3/28/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	380	mg/L	1	10	3/21/2019	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	2.2	mg/L	2	0.040	3/28/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.52	mg/L	0.5	0.20	3/26/2019	NV00925

Customer Sample ID: YD @SBC (4) **Collect Date/Time:** 3/19/2019 08:00

WETLAB Sample ID: 19030529-009 **Receive Date:** 3/19/2019 17:00

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.093	mg/L	1	0.020	3/20/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.083	mg/L	1	0.020	3/21/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	16	mg/L	1	1.0	3/20/2019	NV00925
Total Nitrogen	Calc.	2.7	mg/L	1	0.24	3/28/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	390	mg/L	1	10	3/21/2019	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Customer Sample ID: YD @SBC (4) **Collect Date/Time:** 3/19/2019 08:00

WETLAB Sample ID: 19030529-009 **Receive Date:** 3/19/2019 17:00

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	2.2	mg/L	2	0.040	3/28/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.56	mg/L	0.5	0.20	3/26/2019	NV00925

Customer Sample ID: NTD @ BFD (1) **Collect Date/Time:** 3/18/2019 12:00

WETLAB Sample ID: 19030529-010 **Receive Date:** 3/19/2019 17:00

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.070	mg/L	1	0.020	3/20/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.10	mg/L	1	0.020	3/21/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	120	mg/L	1	1.0	3/20/2019	NV00925
Total Nitrogen	Calc.	3.9	mg/L	1	0.22	3/28/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	910	mg/L	1	10	3/21/2019	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	1.9	mg/L	1	0.020	3/28/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	2.0	mg/L	0.5	0.20	3/26/2019	NV00925

Customer Sample ID: NTD @ BFD (2) **Collect Date/Time:** 3/18/2019 18:00

WETLAB Sample ID: 19030529-011 **Receive Date:** 3/19/2019 17:00

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.061	mg/L	1	0.020	3/20/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.23 M	mg/L	1	0.020	3/21/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	53	mg/L	1	1.0	3/20/2019	NV00925
Total Nitrogen	Calc.	3.5	mg/L	1	0.22	3/28/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	950	mg/L	1	10	3/21/2019	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	1.9	mg/L	1	0.020	3/28/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	1.6 M	mg/L	0.5	0.20	3/26/2019	NV00925

Customer Sample ID: NTD @ BFD (3) **Collect Date/Time:** 3/19/2019 00:00

WETLAB Sample ID: 19030529-012 **Receive Date:** 3/19/2019 17:00

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.075	mg/L	1	0.020	3/20/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.18	mg/L	1	0.020	3/21/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	38	mg/L	1	1.0	3/20/2019	NV00925
Total Nitrogen	Calc.	3.2	mg/L	1	0.22	3/28/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	930	mg/L	1	10	3/21/2019	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	2.0	mg/L	1	0.020	3/28/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	1.2	mg/L	0.5	0.20	3/26/2019	NV00925

Customer Sample ID: NTD @ BFD (3) **Collect Date/Time:** 3/19/2019 00:00

WETLAB Sample ID: 19030529-012 **Receive Date:** 3/19/2019 17:00

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID

Customer Sample ID: NTD @ BFD (4) **Collect Date/Time:** 3/19/2019 06:00

WETLAB Sample ID: 19030529-013 **Receive Date:** 3/19/2019 17:00

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.067	mg/L	1	0.020	3/20/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.16	mg/L	1	0.020	3/21/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	26	mg/L	1	1.0	3/20/2019	NV00925
Total Nitrogen	Calc.	3.3	mg/L	1	0.24	3/28/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	900	mg/L	1	10	3/21/2019	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	2.1	mg/L	2	0.040	3/28/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	1.2	mg/L	0.5	0.20	3/26/2019	NV00925

Customer Sample ID: SBC @ CWW (1) **Collect Date/Time:** 3/18/2019 12:00

WETLAB Sample ID: 19030529-014 **Receive Date:** 3/19/2019 17:00

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.10	mg/L	1	0.020	3/20/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.23	mg/L	1	0.020	3/21/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	65	mg/L	1	1.0	3/20/2019	NV00925
Total Nitrogen	Calc.	1.3	mg/L	1	0.22	3/28/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	330	mg/L	1	10	3/21/2019	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	0.48	mg/L	1	0.020	3/28/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.86	mg/L	0.5	0.20	3/26/2019	NV00925

Customer Sample ID: SBC @ CWW (2) **Collect Date/Time:** 3/18/2019 18:00

WETLAB Sample ID: 19030529-015 **Receive Date:** 3/19/2019 17:00

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.11	mg/L	1	0.020	3/20/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.19	mg/L	1	0.020	3/22/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	46	mg/L	1	1.0	3/20/2019	NV00925
Total Nitrogen	Calc.	1.2	mg/L	1	0.22	3/28/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	310	mg/L	1	10	3/21/2019	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	0.48 M	mg/L	1	0.020	3/28/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.68	mg/L	0.5	0.20	3/26/2019	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Customer Sample ID: SBC @ CWW (3) **Collect Date/Time:** 3/19/2019 00:00

WETLAB Sample ID: 19030529-016 **Receive Date:** 3/19/2019 17:00

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.12	mg/L	1	0.020	3/20/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.21	mg/L	1	0.020	3/22/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	60	mg/L	1	1.0	3/20/2019	NV00925
Total Nitrogen	Calc.	1.2	mg/L	1	0.22	3/28/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	300	mg/L	1	10	3/21/2019	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	0.49	mg/L	1	0.020	3/28/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.67	mg/L	0.5	0.20	3/26/2019	NV00925

Customer Sample ID: SBC @ CWW (4) **Collect Date/Time:** 3/19/2019 06:00

WETLAB Sample ID: 19030529-017 **Receive Date:** 3/19/2019 17:00

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.12	mg/L	1	0.020	3/20/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.17	mg/L	1	0.020	3/22/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	47	mg/L	1	1.0	3/20/2019	NV00925
Total Nitrogen	Calc.	1.1	mg/L	1	0.22	3/28/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	340	mg/L	1	10	3/21/2019	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	0.46	mg/L	1	0.020	3/28/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.62	mg/L	0.5	0.20	3/26/2019	NV00925

Customer Sample ID: CC @ CB **Collect Date/Time:** 3/19/2019 10:35

WETLAB Sample ID: 19030529-018 **Receive Date:** 3/19/2019 17:00

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.31	mg/L	1	0.020	3/20/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.32	mg/L	1	0.020	3/22/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	5	mg/L	1	1	3/20/2019	NV00925
Total Nitrogen	Calc.	2.5	mg/L	1	0.22	3/28/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	2900	mg/L	1	10	3/21/2019	NV00925
Anions by Ion Chromatography							
Nitrate Nitrogen	EPA 300.0	1.2	mg/L	5	0.15	3/20/2019	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	1.6	mg/L	1	0.020	3/28/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.94	mg/L	0.5	0.20	3/26/2019	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Customer Sample ID:	TC @ SMP	**Collect Date/Time:**	3/19/2019 11:25
WETLAB Sample ID:	19030529-019	**Receive Date:**	3/19/2019 17:00

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.041	mg/L	1	0.020	3/20/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.045	mg/L	1	0.020	3/25/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	5	mg/L	1	1	3/20/2019	NV00925
Total Nitrogen	Calc.	ND	mg/L	1	0.22	3/28/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	89	mg/L	1	10	3/21/2019	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	ND	mg/L	1	0.020	3/28/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	ND	mg/L	0.5	0.20	3/26/2019	NV00925

Customer Sample ID:	AC @ MAC	**Collect Date/Time:**	3/19/2019 08:30
WETLAB Sample ID:	19030529-020	**Receive Date:**	3/19/2019 17:00

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.041	mg/L	1	0.020	3/20/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.070	mg/L	1	0.020	3/25/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	34	mg/L	1	1.0	3/20/2019	NV00925
Total Nitrogen	Calc.	0.31	mg/L	1	0.22	3/28/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	420	mg/L	1	10	3/21/2019	NV00925
Anions by Ion Chromatography							
Nitrate Nitrogen	EPA 300.0	ND	mg/L	1	0.030	3/20/2019	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	0.060	mg/L	1	0.020	3/28/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.25	mg/L	0.5	0.20	3/26/2019	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Western Environmental Testing Laboratory
QC Report

QCBatchID	QCType	Parameter	Method	Result	Actual	% Rec	Units
QC19030652	Blank 1	Orthophosphate, as P	SM 4500-P E	ND			mg/L
QC19030661	Blank 1	Total Coliform (MPN)	SM 9223B (Qu	ND			MPN/100ml
		Escherichia Coli (MPN)	SM 9223B (Qu	ND			MPN/100ml
QC19030661	Blank 2	Total Coliform (MPN)	SM 9223B (Qu	ND			MPN/100ml
		Escherichia Coli (MPN)	SM 9223B (Qu	ND			MPN/100ml
QC19030700	Blank 1	Nitrate Nitrogen	EPA 300.0	ND			mg/L
QC19030734	Blank 1	Total Suspended Solids (TSS)	SM 2540D	ND			mg/L
QC19030740	Blank 1	Total Phosphorous as P	SM 4500-P E	ND			mg/L
QC19030792	Blank 1	Dissolved Phosphorous as P	SM 4500-P E	ND			mg/L
QC19030824	Blank 1	Total Dissolved Solids (TDS)	SM 2540C	ND			mg/L
QC19030826	Blank 1	Total Dissolved Solids (TDS)	SM 2540C	ND			mg/L
QC19030855	Blank 1	Total Phosphorous as P	SM 4500-P E	ND			mg/L
QC19030903	Blank 1	Total Kjeldahl Nitrogen	EPA 351.2	ND			mg/L
QC19030997	Blank 1	Nitrate + Nitrite Nitrogen	EPA 353.2	ND			mg/L
QC19030998	Blank 1	Nitrate + Nitrite Nitrogen	EPA 353.2	ND			mg/L

QCBatchID	QCType	Parameter	Method	Result	Actual	% Rec	Units
QC19030652	LCS 1	Orthophosphate, as P	SM 4500-P E	0.269	0.250	107	mg/L
QC19030700	LCS 1	Nitrate Nitrogen	EPA 300.0	0.456	0.500	91	mg/L
QC19030734	LCS 1	Total Suspended Solids (TSS)	SM 2540D	200	200	100	mg/L
QC19030734	LCS 2	Total Suspended Solids (TSS)	SM 2540D	201	200	101	mg/L
QC19030740	LCS 1	Total Phosphorous as P	SM 4500-P E	0.281	0.250	112	mg/L
QC19030792	LCS 1	Dissolved Phosphorous as P	SM 4500-P E	0.229	0.250	92	mg/L
QC19030824	LCS 1	Total Dissolved Solids (TDS)	SM 2540C	141	150	94	mg/L
QC19030824	LCS 2	Total Dissolved Solids (TDS)	SM 2540C	138	150	92	mg/L
QC19030826	LCS 1	Total Dissolved Solids (TDS)	SM 2540C	137	150	91	mg/L
QC19030826	LCS 2	Total Dissolved Solids (TDS)	SM 2540C	138	150	92	mg/L
QC19030855	LCS 1	Total Phosphorous as P	SM 4500-P E	0.287	0.250	115	mg/L
QC19030903	LCS 1	Total Kjeldahl Nitrogen	EPA 351.2	1.08	1.00	108	mg/L
QC19030997	LCS 1	Nitrate + Nitrite Nitrogen	EPA 353.2	1.04	1.00	104	mg/L
QC19030998	LCS 1	Nitrate + Nitrite Nitrogen	EPA 353.2	1.05	1.00	105	mg/L

QCBatchID	QCType	Parameter	Method	Duplicate Sample	Sample Result	Duplicate Result	Units	RPD
QC19030734	Duplicate 1	Total Suspended Solids (TSS)	SM 2540D	19030529-00	34.7	34.7	mg/L	<1%
QC19030734	Duplicate 2	Total Suspended Solids (TSS)	SM 2540D	19030529-01	52.7	51.3	mg/L	3 %
QC19030824	Duplicate 1	Total Dissolved Solids (TDS)	SM 2540C	19030500-00	4848	4784	mg/L	1 %
QC19030824	Duplicate 2	Total Dissolved Solids (TDS)	SM 2540C	19030511-00	1060	1034	mg/L	2 %
QC19030826	Duplicate 1	Total Dissolved Solids (TDS)	SM 2540C	19030529-01	954	930	mg/L	2 %
QC19030826	Duplicate 2	Total Dissolved Solids (TDS)	SM 2540C	19030529-01	2940	2928	mg/L	<1%

QCBatchID	QCType	Parameter	Method	Spike Sample	Sample Result		MS Result	MSD Result	Spike Value	Units	MS %Rec	MSD %Rec	RPD %
QC19030652	MS 1	Orthophosphate, as P	SM 4500-P E	19030529-001	ND		0.248	0.249	0.25	mg/L	99	99	<1
QC19030652	MS 2	Orthophosphate, as P	SM 4500-P E	19030529-011	0.061		0.309	0.306	0.25	mg/L	99	98	1
QC19030700	MS 1	Nitrate Nitrogen	EPA 300.0	19030529-020	ND		0.472	0.504	0.5	mg/L	89	95	7
QC19030700	MS 2	Nitrate Nitrogen	EPA 300.0	19030561-012	ND	U	0.478	0.510	0.5	mg/L	96	102	6

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

QCBatchID	QCType	Parameter	Method	Spike Sample	Sample Result		MS Result	MSD Result	Spike Value	Units	MS %Rec	MSD %Rec	RPD %
QC19030740	MS 1	Total Phosphorous as P	SM 4500-P E	19030529-001	0.034	QD	0.331	0.265	0.25	mg/L	119	92	22
QC19030740	MS 2	Total Phosphorous as P	SM 4500-P E	19030529-011	0.235	M	0.431	0.397	0.25	mg/L	NC	NC	NC
QC19030792	MS 1	Dissolved Phosphorous as P	SM 4500-P E	19030561-001	ND	U	0.245	0.268	0.25	mg/L	98	107	9
QC19030792	MS 2	Dissolved Phosphorous as P	SM 4500-P E	19030561-011	ND	U	0.262	0.264	0.25	mg/L	105	106	<1
QC19030855	MS 1	Total Phosphorous as P	SM 4500-P E	19030635-005	0.096	M	0.403	0.404	0.25	mg/L	NC	NC	NC
QC19030855	MS 2	Total Phosphorous as P	SM 4500-P E	19030529-019	0.045		0.326	0.332	0.25	mg/L	112	115	2
QC19030903	MS 1	Total Kjeldahl Nitrogen	EPA 351.2	19030529-001	0.262		0.790	0.725	0.5	mg/L	106	92	9
QC19030903	MS 2	Total Kjeldahl Nitrogen	EPA 351.2	19030529-011	1.60	M	1.98	2.00	0.5	mg/L	NC	NC	NC
QC19030997	MS 1	Nitrate + Nitrite Nitrogen	EPA 353.2	19030510-004	0.364	M	6.31	6.28	1	mg/L	NC	NC	NC
QC19030997	MS 2	Nitrate + Nitrite Nitrogen	EPA 353.2	19030529-005	0.958		2.02	2.02	1	mg/L	106	106	<1
QC19030998	MS 1	Nitrate + Nitrite Nitrogen	EPA 353.2	19030529-015	0.481	M	1.59	1.59	1	mg/L	NC	NC	NC
QC19030998	MS 2	Nitrate + Nitrite Nitrogen	EPA 353.2	19030582-002	0.363	M	5.87	5.85	1	mg/L	NC	NC	NC

WETLAB
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WETLAB Order ID. 19030529
Sparks Control # ____
Elko Control # ____
LV Control # ____
Report Due Date ____
Page 1 of 3

Client: Balance Hydrologics
Address: on file
City, State & Zip:
Contact:
Phone:
Collector's Name:
Fax:
PWS/Project Name:
P.O. Number:
PWS/Project Number:
Email:

Turnaround Time Requirements
Standard X
5 Day* (25%) ____ 72 Hour* (50%) ____
48 Hour* (100%) ____ 24 Hour* (200%) ____
*Surcharges Will Apply

Samples Collected From Which State?
NV ✓ CA ____
Other ____

Compliance Monitoring? Yes [✓ No]

Report to Regulatory Agency? Yes [✓ No]

Report Results Via [✓ PDF] EDD
Other ____

Standard QC Required? [✓ Yes] No

Billing Address (if different than Client Address)
Company ____
Address ____
City, State & Zip ____
Contact ____
Phone ____ Fax ____
Email ____

SAMPLE ID/LOCATION	DATE	TIME	PRES TYPE *	SAMPLE TYPE **	NO. OF CONTAINERS	Total N	Total P	Ortho P	TDS	TSS	NO3	E Coli				Spl. No.
AC@ TR*	3/19/19	9:05		SW	3	X	X	X	X	X	X	X				1
BS @ SBC (1)	3/18/19	13:00			2	X	X	X	X	X						2
BS@ SBC (2)	3/18/19	19:00				X	X	X	X	X						3
BS @ SBC (3)	3/19/19	1:00				X	X	X	X	X						4
BS @ SBC(4)	3/19/19	7:00				X	X	X	X	X						5
YD @ SBC (1)	3/18/19	14:00				X	X	X	X	X						6
YD@ SBC (2)	3/18/19	20:00				X	X	X	X	X						7
YD@ SBC (3)	3/19/19	2:00				X	X	X	X	X						8
YD@ SBC (4)	3/19/19	8:00		↓	↓	X	X	X	X	X						9

1903 2
0529 20

Instructions/Comments/Special Requirements:

Sample Matrix Key** **DW** = Drinking Water **WW** = Wastewater **SW** = Surface Water **MW** = Monitoring Well **SD** = Solid/Sludge **SO** = Soil **HW** = Hazardous Waste **OTHER:** ____

***SAMPLE PRESERVATIVES:** 1=Unpreserved 2=H2SO4 3=NaOH 4=HCl 5=HNO3 6=Na2S2O3 7=ZnOAc+NaOH 8=HCl/VOA Vial

Temp	Custody Seal	# of Containers	DATE	TIME	Samples Relinquished By	Samples Received By
8.9°C	Y N [✓ None]		3/19/19	1700		
°C	Y N None					
°C	Y N None					
°C	Y N None					

WETLAB'S Standard Terms and Conditions apply unless written agreements specify otherwise. Payment terms are Net 30.

Client/Collector attests to the validity and authenticity of this (these) sample(s) and, is (are) aware that tampering with or intentionally mislabeling the sample(s) location, date or time of collection may be considered fraud and subject to legal action (NAC445.0636). ________ initial

To the maximum extent permitted by law, the Client agrees to limit the liability of WETLAB for the Client's damages to the total compensation received, unless other agreements are made in writing. This limitation shall apply regardless of the cause of action or legal theory pled or asserted. ________ initial

WETLAB will dispose of samples 90 days from sample receipt. Client may request a longer sample storage time for an additional fee. Please contact your Project Manager for details. ________ initial

WETLAB
WESTERN ENVIRONMENTAL TESTING LABORATORY
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1084 Lamoille Highway | Elko, Nevada 89801
tel (775) 777-9933 | fax (775) 777-9933
3230 Polaris Ave., Suite 4 | Las Vegas, Nevada 89102
tel (702) 475-8899 | fax (702) 776-6152

WETLAB Order ID. 19030529
Sparks Control #
Elko Control #
LV Control #
Report Due Date
Page 2 of 3

Client Balance Hydrologics
Address on file
City, State & Zip
Contact
Phone
Collector's Name
Fax
PWS/Project Name
P.O. Number
PWS/Project Number
Email

Turnaround Time Requirements
Standard X
5 Day* (25%)
72 Hour* (50%)
48 Hour* (100%)
24 Hour* (200%)
*Surcharges Will Apply

Samples Collected From Which State?
NV X CA
Other

Compliance Monitoring?
Yes [✓ No]

Report to Regulatory Agency?
Yes [✓ No]

Report Results Via
[✓ PDF] EDD
Other

Standard QC Required?
[✓ Yes] No

Billing Address (if different than Client Address)
Company
Address
City, State & Zip
Contact
Phone
Fax
Email

SAMPLE ID/LOCATION	DATE	TIME	PRES TYPE *	SAMPLE TYPE **	NO. OF CONTAINERS	Total N	Total P	OrthoP	NO_3	TDS	TSS					Spl. No.
NTD @ BFD (1)	3/18/19	12:00		SW	2	X	X	X		X	X					10
NTD @ BFD (2)	3/18/19	18:00				X	X	X		X	X					11
NTD @ BFD (3)	3/19/19	0:00				X	X	X		X	X					12
NTD @ BFD (4)	3/19/19	6:00				X	X	X		X	X					13
SBL @ CWW (1)	3/18/19	12:00				X	X	X		X	X					14
SBL @ CWW (2)	3/18/19	18:00				X	X	X		X	X					15
SBC @ CWW (3)	3/19/19	0:00				X	X	X		X	X					16
SBL @ CWW (4)	3/19/19	6:00				X	X	X		X	X					17
CC @ CB	3/19/19	10:35		↓	↓	X	X	X	X	X	X					18

1903 2
0529 20

Instructions/Comments/Special Requirements:

Sample Matrix Key** DW = Drinking Water WW = Wastewater SW = Surface Water MW = Monitoring Well SD = Solid/Sludge SO = Soil HW = Hazardous Waste OTHER:

***SAMPLE PRESERVATIVES:** 1=Unpreserved 2=H2SO4 3=NaOH 4=HCl 5=HNO3 6=Na2S2O3 7=ZnOAc+NaOH 8=HCl/VOA Vial

Temp	Custody Seal	# of Containers	DATE	TIME	Samples Relinquished By	Samples Received By
8.9 °C	Y N [✓ None]		3/19/19	1700		
°C	Y N None					
°C	Y N None					
°C	Y N None					

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WETLAB Order ID. 19030529
Sparks Control #
Elko Control #
LV Control #
Report Due Date
Page 3 of 3

Client Balance Hydrologics
Address
City, State & Zip
Contact
Phone
Collector's Name
Fax
PWS/Project Name
P.O. Number
PWS/Project Number
Email

Turnaround Time Requirements
Standard X
5 Day* (25%)
72 Hour* (50%)
48 Hour* (100%)
24 Hour* (200%)
*Surcharges Will Apply

Samples Collected From Which State? NV X CA Other

Report Results Via [✓ PDF] EDD Other

Compliance Monitoring? Yes [✓ No]

Report to Regulatory Agency? Yes [✓ No]

Standard QC Required? [✓ Yes] No

Billing Address (if different than Client Address)
Company
Address
City, State & Zip
Contact
Phone
Fax
Email

SAMPLE ID/LOCATION	DATE	TIME	PRES TYPE *	SAMPLE TYPE **	NO. OF CONTAINERS	Total N	Total P	Ortho P	TDS	TSS	NO_3					Spl. No.
TC @ SMP	3/19/19	11:25		SW	2	X	X	X	X	X						19
AC @ MAC	3/19/19	8:30		↓	↓	X	X	X	X	X	X					20

1903 2
0529 20

Instructions/Comments/Special Requirements:

Sample Matrix Key** DW = Drinking Water WW = Wastewater SW = Surface Water MW = Monitoring Well SD = Solid/Sludge SO = Soil HW = Hazardous Waste OTHER:

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Temp	Custody Seal	# of Containers	DATE	TIME	Samples Relinquished By	Samples Received By
8.9°C	Y N [✓ None]		3/19/19	1700		
°C	Y N None					
°C	Y N None					
°C	Y N None					

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TESTING LABORATORY

www.WETLaboratory.com

Specializing in Soil, Hazardous Waste and Water Analysis

3/29/2019

Balance Hydrologics
800 Baucroft Ave. Suite 101
Berkeley, CA 94710
Attn: Brian Hastings

OrderID: *19030511*

Dear: Brian Hastings

This is to transmit the attached analytical report. The analytical data and information contained therein was generated using specified or selected methods contained in references, such as Standard Methods for the Examination of Water and Wastewater, online edition, Methods for Determination of Organic Compounds in Drinking Water, EPA-600/4-79-020, and Test Methods for Evaluation of Solid Waste, Physical/Chemical Methods (SW846) Third Edition.

The samples were received by WETLAB-Western Environmental Testing Laboratory in good condition on 3/18/2019. Additional comments are located on page 2 of this report.

If you should have any questions or comments regarding this report, please do not hesitate to call.

Sincerely,

ASmith

Andy Smith
QA Manager

Western Environmental Testing Laboratory
Report Comments

Balance Hydrologics - 19030511

Specific Report Comments

None

Report Legend

B	--	Blank contamination; Analyte detected above the method reporting limit in an associated blank
D	--	Due to the sample matrix dilution was required in order to properly detect and report the analyte. The reporting limit has been adjusted accordingly.
HT	--	Sample analyzed beyond the accepted holding time
J	--	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit
M	--	The matrix spike/matrix spike duplicate (MS/MSD) values for the analysis of this parameter were outside acceptance criteria due to probable matrix interference. The reported result should be considered an estimate.
N	--	There was insufficient sample available to perform a spike and/or duplicate on this analytical batch.
NC	--	Not calculated due to matrix interference
QD	--	The sample duplicate or matrix spike duplicate analysis demonstrated sample imprecision. The reported result should be considered an estimate.
QL	--	The result for the laboratory control sample (LCS) was outside WETLAB acceptance criteria and reanalysis was not possible. The reported data should be considered an estimate.
S	--	Surrogate recovery was outside of laboratory acceptance limits due to matrix interference. The associated blank and LCS surrogate recovery was within acceptance limits
SC	--	Spike recovery not calculated. Sample concentration >4X the spike amount; therefore, the spike could not be adequately recovered
U	--	The analyte was analyzed for, but was not detected above the level of the reported sample reporting/quantitation limit

General Lab Comments

Per method recommendation (section 4.4), Samples analyzed by methods EPA 300.0 and EPA 300.1 have been filtered prior to analysis.

The following is an interpretation of the results from EPA method 9223B:
A result of zero (0) indicates absence for both coliform and Escherichia coli meaning the water meets the microbiological requirements of the U.S. EPA Safe Drinking Water Act (SDWA). A result of one (1) for either test indicates presence and the water does not meet the SDWA requirements. Waters with positive tests should be disinfected by a certified water treatment operator and retested.

Per federal regulation the holding time for the following parameters in aqueous/water samples is 15 minutes: Residual Chlorine, pH, Dissolved Oxygen, Sulfite.

Western Environmental Testing Laboratory
Analytical Report

Balance Hydrologics
800 Baucroft Ave. Suite 101
Berkeley, CA 94710
Attn: Brian Hastings
Phone: (510-704-1000 **Fax:**

Date Printed: 3/29/2019
OrderID: *19030511*

Customer Sample ID: WC@OVH
WETLAB Sample ID: 19030511-001

Collect Date/Time: 3/18/2019 15:15
Receive Date: 3/18/2019 16:44

Analyte	**Method**	**Results**		**Units**	**DF**	**RL**	**Analyzed**	**LabID**
General Chemistry								
Orthophosphate, as P	SM 4500-P E	ND		mg/L	1	0.020	3/19/2019	NV00925
Total Phosphorous as P	SM 4500-P E	ND	M	mg/L	1	0.020	3/19/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	2		mg/L	1	1	3/19/2019	NV00925
Total Nitrogen	Calc.	ND		mg/L	1	0.22	3/28/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	50		mg/L	1	10	3/21/2019	NV00925
Microbiological Analyses								
Total Coliform (MPN)	SM 9223B (Quantitray)	62.4		MPN/100ml	1	1.0	3/18/2019	NV00925
Escherichia Coli (MPN)	SM 9223B (Quantitray)	11.0		MPN/100ml	1	1.0	3/18/2019	NV00925
Flow Injection Analyses								
Nitrate + Nitrite Nitrogen	EPA 353.2	ND		mg/L	1	0.020	3/28/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	ND		mg/L	0.5	0.20	3/20/2019	NV00925

Customer Sample ID: SBC@RHR
WETLAB Sample ID: 19030511-002

Collect Date/Time: 3/18/2019 15:40
Receive Date: 3/18/2019 16:44

Analyte	**Method**	**Results**		**Units**	**DF**	**RL**	**Analyzed**	**LabID**
General Chemistry								
Orthophosphate, as P	SM 4500-P E	0.17		mg/L	1	0.020	3/19/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.26	M	mg/L	1	0.020	3/19/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	20		mg/L	1	1.0	3/19/2019	NV00925
Total Nitrogen	Calc.	0.75		mg/L	1	0.22	3/28/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	200		mg/L	1	10	3/21/2019	NV00925
Microbiological Analyses								
Total Coliform (MPN)	SM 9223B (Quantitray)	214.3		MPN/100ml	1	1.0	3/18/2019	NV00925
Escherichia Coli (MPN)	SM 9223B (Quantitray)	15.6		MPN/100ml	1	1.0	3/18/2019	NV00925
Flow Injection Analyses								
Nitrate + Nitrite Nitrogen	EPA 353.2	0.13		mg/L	1	0.020	3/28/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.62		mg/L	0.5	0.20	3/20/2019	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Customer Sample ID: SBC@NAR **Collect Date/Time:** 3/18/2019 14:30

WETLAB Sample ID: 19030511-003 **Receive Date:** 3/18/2019 16:44

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.15	mg/L	1	0.020	3/19/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.28	mg/L	1	0.020	3/19/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	31	mg/L	1	1.0	3/19/2019	NV00925
Total Nitrogen	Calc.	0.80	mg/L	1	0.22	3/28/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	360	mg/L	1	10	3/21/2019	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	0.034	mg/L	1	0.020	3/28/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	0.76	mg/L	0.5	0.20	3/20/2019	NV00925

Customer Sample ID: NTD@ORD **Collect Date/Time:** 3/18/2019 16:20

WETLAB Sample ID: 19030511-004 **Receive Date:** 3/18/2019 16:44

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Orthophosphate, as P	SM 4500-P E	0.15	mg/L	1	0.020	3/19/2019	NV00925
Total Phosphorous as P	SM 4500-P E	0.29	mg/L	1	0.020	3/19/2019	NV00925
Total Suspended Solids (TSS)	SM 2540D	30	mg/L	1	1.0	3/19/2019	NV00925
Total Nitrogen	Calc.	2.7	mg/L	1	0.22	3/28/2019	NV00925
Total Dissolved Solids (TDS)	SM 2540C	1100	mg/L	1	10	3/21/2019	NV00925
Flow Injection Analyses							
Nitrate + Nitrite Nitrogen	EPA 353.2	1.4	mg/L	1	0.020	3/28/2019	NV00925
Total Kjeldahl Nitrogen	EPA 351.2	1.3	mg/L	0.5	0.20	3/20/2019	NV00925

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Western Environmental Testing Laboratory
QC Report

QCBatchID	QCType	Parameter	Method	Result	Actual	% Rec	Units
QC19030620	Blank 1	Total Phosphorous as P	SM 4500-P E	ND			mg/L
QC19030621	Blank 1	Orthophosphate, as P	SM 4500-P E	ND			mg/L
QC19030684	Blank 1	Total Kjeldahl Nitrogen	EPA 351.2	ND			mg/L
QC19030697	Blank 1	Total Suspended Solids (TSS)	SM 2540D	ND			mg/L
QC19030769	Blank 1	Total Coliform (MPN)	SM 9223B (Qu	ND			MPN/100ml
		Escherichia Coli (MPN)	SM 9223B (Qu	ND			MPN/100ml
QC19030824	Blank 1	Total Dissolved Solids (TDS)	SM 2540C	ND			mg/L
QC19030997	Blank 1	Nitrate + Nitrite Nitrogen	EPA 353.2	ND			mg/L

QCBatchID	QCType	Parameter	Method	Result	Actual	% Rec	Units
QC19030620	LCS 1	Total Phosphorous as P	SM 4500-P E	0.250	0.250	100	mg/L
QC19030621	LCS 1	Orthophosphate, as P	SM 4500-P E	0.258	0.250	103	mg/L
QC19030684	LCS 1	Total Kjeldahl Nitrogen	EPA 351.2	0.920	1.00	92	mg/L
QC19030697	LCS 1	Total Suspended Solids (TSS)	SM 2540D	199	200	99	mg/L
QC19030697	LCS 2	Total Suspended Solids (TSS)	SM 2540D	200	200	100	mg/L
QC19030824	LCS 1	Total Dissolved Solids (TDS)	SM 2540C	141	150	94	mg/L
QC19030824	LCS 2	Total Dissolved Solids (TDS)	SM 2540C	138	150	92	mg/L
QC19030997	LCS 1	Nitrate + Nitrite Nitrogen	EPA 353.2	1.04	1.00	104	mg/L

QCBatchID	QCType	Parameter	Method	Duplicate Sample	Sample Result	Duplicate Result	Units	RPD
QC19030697	Duplicate 1	Total Suspended Solids (TSS)	SM 2540D	19030484-00	408	416	mg/L	2 %
QC19030697	Duplicate 2	Total Suspended Solids (TSS)	SM 2540D	19030519-00	70.0	80.0	mg/L	13 %
QC19030824	Duplicate 1	Total Dissolved Solids (TDS)	SM 2540C	19030500-00	4848	4784	mg/L	1 %
QC19030824	Duplicate 2	Total Dissolved Solids (TDS)	SM 2540C	19030511-00	1060	1034	mg/L	2 %

QCBatchID	QCType	Parameter	Method	Spike Sample	Sample Result		MS Result	MSD Result	Spike Value	Units	MS %Rec	MSD %Rec	RPD %
QC19030620	MS 1	Total Phosphorous as P	SM 4500-P E	19030511-001	ND	M	0.300	0.281	0.25	mg/L	NC	NC	NC
QC19030620	MS 2	Total Phosphorous as P	SM 4500-P E	19030511-002	0.262	M	0.569	0.564	0.25	mg/L	NC	NC	NC
QC19030621	MS 1	Orthophosphate, as P	SM 4500-P E	19030511-001	ND		0.256	0.262	0.25	mg/L	102	104	2
QC19030684	MS 1	Total Kjeldahl Nitrogen	EPA 351.2	19030511-001	ND		0.560	0.560	0.5	mg/L	103	103	<1
QC19030997	MS 1	Nitrate + Nitrite Nitrogen	EPA 353.2	19030510-004	0.364	M	6.31	6.28	1	mg/L	NC	NC	NC
QC19030997	MS 2	Nitrate + Nitrite Nitrogen	EPA 353.2	19030529-005	0.958		2.02	2.02	1	mg/L	106	106	<1

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WETLAB Order ID. 1903051I
Sparks Control #
Elko Control #
LV Control #
Report Due Date
Page ____ of ____

Client Balance Hydrologics
Address on file
City, State & Zip
Contact
Phone
Collector's Name
Fax
PWS/Project Name
P.O. Number
PWS/Project Number
Email

Turnaround Time Requirements
Standard X
5 Day* (25%) ____ 72 Hour* (50%) ____
48 Hour* (100%) ____ 24 Hour* (200%) ____
*Surcharges Will Apply

Samples Collected From Which State?
NV X CA ____ Other ____

Report Results Via
[✓ PDF] EDD
Other ____

Compliance Monitoring?
Yes [✓ No]

Report to Regulatory Agency?
Yes [✓ No]

Standard QC Required?
[✓ Yes] No

Billing Address (if different than Client Address)
Company ____
Address ____
City, State & Zip ____
Contact ____
Phone ____ Fax ____
Email ____

SAMPLE ID/LOCATION	DATE	TIME	PRES TYPE *	SAMPLE TYPE **	NO. OF CONTAINERS	Total N	Total P	Ortho P	TSS	TDS	E coli					Spl. No.
WC @ OVH	3/18/19	15:15		Aq	3	X	X	X	X	X	X					
SBC @ RHR	|	15:40		|	3	X	X	X	X	X	X					
SBC @ NAR	|	14:30		|	2	X	X	X	X	X						
NTD @ ORD		16:20		|	2	X	X	X	X	X						

Instructions/Comments/Special Requirements:

Sample Matrix Key** **DW** = Drinking Water **WW** = Wastewater **SW** = Surface Water **MW** = Monitoring Well **SD** = Solid/Sludge **SO** = Soil **HW** = Hazardous Waste **OTHER:** ____

***SAMPLE PRESERVATIVES:** 1=Unpreserved 2=H2SO4 3=NaOH 4=HCl 5=HNO3 6=Na2S2O3 7=ZnOAc+NaOH 8=HCl/VOA Vial

Temp	Custody Seal	# of Containers	DATE	TIME	Samples Relinquished By	Samples Received By
9.1 °C	Y N [✓ None]		3/18/19	1644	X	
°C	Y N None					
°C	Y N None					
°C	Y N None					

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301.2E