DEPARTMENT OF
ECOLOGY
State of Washington

Hangman Creek Watershed
Dissolved Oxygen, pH, and Nutrients
Total Maximum Daily Load Study

Data Summary Report

March 2011

Publication No. 11-03-020

Publication Information

This report is available on the Department of Ecology's website at
www.ecy.wa.gov/biblio/1103020.html

Data for this project are available at Ecology's Environmental Information Management (EIM) website www.ecy.wa.gov/eim/index.htm. Search User Study ID, JJOY0005

The Activity Tracker Code for this study is 09-170.

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Data Summary Report

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Waterbody Numbers:
WA-56-1010, -1500, -1600, -2040, -2050

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Abstract

This report summarizes water quality data and streamflow data collected by the Washington State Department of Ecology (Ecology) from September 2008 through September 2009 for the *Hangman Creek Watershed Dissolved Oxygen, pH, and Nutrients Total Maximum Daily Load (TMDL) Study*. The watershed is in northeastern Washington State.

A quality control and quality assurance analysis is included in this data summary.

Field data include pH, conductivity, dissolved oxygen, temperature, and flow. Laboratory data include chloride, total suspended solids, alkalinity, total persulfate nitrogen, nitrate and nitrite nitrogen, ammonia nitrogen, total phosphorus, orthophosphate, total organic carbon, dissolved organic carbon, biochemical oxygen demand, chlorophyll, and volatile organic matter.

In the final report, *Hangman Creek Watershed Dissolved Oxygen, pH, and Nutrients TMDL*, Ecology will conduct a detailed analysis and provide pollutant loading limits for Hangman Creek and its tributaries. Ecology will use data summarized in this report, as well as data from a similar report by the Spokane County Conservation District (SCCD 2005a).

Introduction

Hangman Creek has been the subject of Total Maximum Daily Load (TMDL) evaluations for fecal coliform bacteria, temperature, and turbidity (Joy et al., 2009). Phosphorus loads also have been evaluated to assess seasonal impacts for the *Spokane River/ Lake Spokane Dissolved Oxygen TMDL* (Moore and Ross, 2010). However, the possible role of phosphorus in the Hangman Creek watershed and the pH and dissolved oxygen (DO) criteria violations has not been assessed because data were lacking. This report describes field and laboratory data from TMDL investigations in 2008 and 2009 that will fill the data gaps necessary to complete the pH and DO TMDLs in the watershed.

Data collection included synoptic surveys during the summer and fall low-flow season, monitoring nutrient and chemical reference conditions in the four ecoregions in the watershed, and monitoring Washington/Idaho border nutrient loads. The data collected will also support water quality modeling and statistical analysis to determine load and wasteload allocations.

Study Area

Hangman Creek (also known as Latah Creek) is a trans-boundary watershed that begins in the foothills of the Rocky Mountains of northern Idaho, extends over the southeastern portion of Spokane County, Washington (Figure 1), and is a tributary to the Spokane River. The watershed encompasses over 689 square miles (approximately 441,000 acres). The TMDL allocations are limited to the 446 square miles of watershed within Washington, although some TMDL success depends on upstream controls on the Coeur d'Alene Reservation and in Idaho.

The watershed is dominated by dryland farming, but like other eastern Washington watersheds, is experiencing increases in urbanization and changes in land-use practices. The watershed contains remnant populations of genetically distinct redband trout and other native and introduced fish species.

Ecology and the Spokane County Conservation District are developing TMDLs because several parts of Hangman Creek and its tributaries were identified on the state's 303(d) list of impaired waters for not meeting Washington State water quality standards for fecal coliform, DO, pH, temperature, and turbidity. The existing TMDL only addresses fecal coliform, temperature, and turbidity (Joy et al., 2009). This data report includes assessments of DO and pH. The stream segments addressed by this 2008-09 data collection effort and their specific impairments are listed in Table 1.

Table 1. Hangman Creek Study area waterbodies with pH and DO listings.

Waterbody	Parameter	303(d) Listing ID	Township Range Section
Hangman Creek at State Line	pH, DO	50425, 41985	20N 46E 29
Hangman Creek at Bradshaw Road	DO	41987	22N 44E 16
Hangman Creek at mouth	pH, DO	11391, 11390	25N 42E 23
Hangman Creek at Duncan Road	pH, DO	50421, 47120	23N 43E 11
Hangman Creek at Roberts Road	DO	47123	21N 44E 01
Hangman Creek below Tekoa	DO	8448	20N 45E 14
Hangman Creek Below Tekoa	DO	8450	20N 45E 13
Hangman Creek at River Mile 21	pH	50422	23N 43E 13
Rock Creek at Jackson Road	DO	41990	23N 44E 23
Rock Creek at Rockford	pH	50378	23N 45E 33
Rock Creek at mouth	pH	50377	23N 43E 12
Spangle Creek at mouth	pH	50382	22N 40E 16
Cove Creek at Highway 27	pH, DO	47036, 50343	21N 45E 30
Little Hangman Creek near mouth	DO	8451	20N 45E 24
Little Hangman Creek at mouth	DO	41998	20N 45E 13
Marshall Creek at mouth	pH, DO	50417,41989	25N 43E 31
Marshall Creek at McKenzie Road	DO	47118	24N 42E 22

Water Quality Standards and Beneficial Uses

In the Washington State water quality standards, two pH criteria are established to protect six categories of aquatic communities (WAC 173-201A-200; 2003 edition). Since Hangman Creek watershed has not been designated with a special category, the pH criterion is the state-wide default for salmonid spawning, rearing, and migration:

(2) To protect the designated aquatic life uses of "Salmonid Spawning, Rearing, and Migration," … pH must be kept within the range of 6.5 to 8.5, with a human-caused variation within the above range of less than 0.5 units.

In the water quality standards, freshwater aquatic life use categories are described using key species (salmonid versus warm-water species) and life-stage conditions (spawning versus rearing). Minimum concentrations of DO are used as criteria to protect different categories of aquatic communities [WAC 173-201A-200; 2003 edition]. Hangman Creek has not been designated for protection of any special population of fish. Therefore, the following statewide default designated aquatic life use and criteria are to be protected:

(3) To protect the designated aquatic life use of "Salmonid Spawning, Rearing, and Migration," the lowest 1-day minimum oxygen level must not fall below 8.0 mg/l more than once every ten years on average.

Nutrients such as nitrogen and phosphorus do not have numeric state or federal standards for flowing freshwater systems such as Hangman Creek. In this TMDL, nutrients may be key pollutants for pH and DO criteria violations, so they are called *surrogate parameters*. Nutrient concentrations that cause these problems can be very site-specific. Older U.S. Environmental Protection Agency (EPA) guidelines (EPA, 1986) of 0.1 mg/L phosphorus have proven ineffective in preventing eutrophication in most watersheds.

Study Design and Methods

The primary goals of the *Hangman Creek Watershed Dissolved Oxygen, pH, and Nutrients Total Maximum Daily Load Study* are to:

1. Refine the current landscape model of the Hangman Creek watershed.
2. Develop a numerical water quality model for DO and pH analysis during the low-flow summer period with data from synoptic surveys.

The synoptic survey task has three sub-tasks: time-of-travel tests, 48-hour diel pH and DO monitoring, and synoptic productivity monitoring.

With assistance from the Spokane County Conservation District and Spokane County staff, Ecology collected data in accordance with the requirements of the Hangman Creek Watershed Dissolved Oxygen and pH Quality Assurance Project Plan (Joy, 2008).

The following standard operating procedures (SOPs) were followed, as appropriate. Ecology's Environmental Assessment Program (EAP) SOPs can be found at www.ecy.wa.gov/programs/eap/quality.html

- EAP011 Instantaneous Measurement of Temperature in Water.
- EAP013 Determining Global Positioning System Coordinates.
- EAP015 Grab sampling – Fresh Water.
- EAP023 Winkler Determination of Dissolved Oxygen.
- EAP024 Estimating Streamflow.
- EAP031 Measurement of pH in Freshwater.
- EAP032 Measurement of Conductivity in Freshwater.
- EAP033 Hydrolab® DataSonde and MiniSonde Multiprobes.
- EAP035 Measurement of Dissolved Oxygen in Surface Water.
- USGS (2006). Equal-width increment depth integrated sampling.

Methods for collecting laboratory parameters, flow measurements, and field parameters are described in Ecology's field measurements and sampling protocols manual (Ecology, 1993). In addition, Ecology obtained data from the U.S. Geological Survey (USGS) and Spokane County Conservation District streamflow gages for use in the project.

Sampling began in September 2008 and ended in September 2009 (Table 2). Reconnaissance surveys occurred in September 2008, and a full water year (October to September) of border and reference site sampling was completed. Synoptic surveys and run-off event surveys are also noted in Table 2. Sampling locations are displayed in Figure 1.

Table 2. Sampling schedule: number of sampling tasks per month.

Survey	Sept08	Oct08	Nov08	Dec08	Jan09	Feb09	Mar09
Reconnaissance	1						
Border/Reference		1	1	1	1	1	2
Synoptic							
Runoff						1	

Survey	Apr09	May09	Jun09	July09	Aug09	Sept09
Border/Reference	2	2	2	1	1	1
Synoptic			1	1		

Table 3 summarizes laboratory and field methods used during this study.

Table 3. Laboratory and field methods.

Analysis	Method	Expected Range of Concentrations	Method Reporting Limits and/or Resolution
Laboratory			
Chloride	EPA 300.0	0.3 – 100 mg/L	0.1 mg/L
Total Suspended Solids	SM 2540D	1 – 10,000 mg/L	1 mg/L
Turbidity	SM 2130	<1 – 7,000 NTU	1 NTU
Alkalinity	SM 2320	20 – 200 mg/L as $CaCO_3$	10 mg/L
Ammonia	SM 4500-NH3H	<0.01 – 30 mg/L	0.01 mg/L
Dissolved Organic Carbon	SM 5310B	<1 – 20 mg/L	1 mg/L
Dissolved Nitrate/Nitrite	SM 4500-NO3 I	<0.01 – 30 mg/L	0.01 mg/L
Total Persulfate Nitrogen	SM 4500-NO3B	0.5 – 50 mg/L	0.025 mg/L
Dissolved Orthophosphate	SM 4500-P G	0.01 – 5.0 mg/L	0.003 mg/L
Total Phosphorous	SM 4500-P F	0.01 – 10 mg/L	0.005 mg/L
Total Organic Carbon	SM 5310B	<1 – 20 mg/L	1 mg/L
Biochemical Oxygen Demand	SM 5210B	<1 – 14 mg/L	2 mg/L
Chlorophyll a	SM 10300	1 – 1000 mg/m2	1 mg/m2
Ash-free Dry Weight	SM 10300	1 – 1000 mg/m2	1 mg/m2
Field			
Water Temperature	EAP033	1-30 ^{o}C	0.01^{o}C
Specific conductivity	EAP033	50-500 uS/cm	0.1 uS/cm
pH	EAP033	6-9 s.u.	0.05 s.u.
Dissolved Oxygen	EAP033	1-12 mg/L	0.01 mg/L
Flow	EAP024	<0.1-10 ft/sec	0.01 ft/sec

EPA: Approved EPA analytical method.
SM: Standard Methods (APHA, 2005).

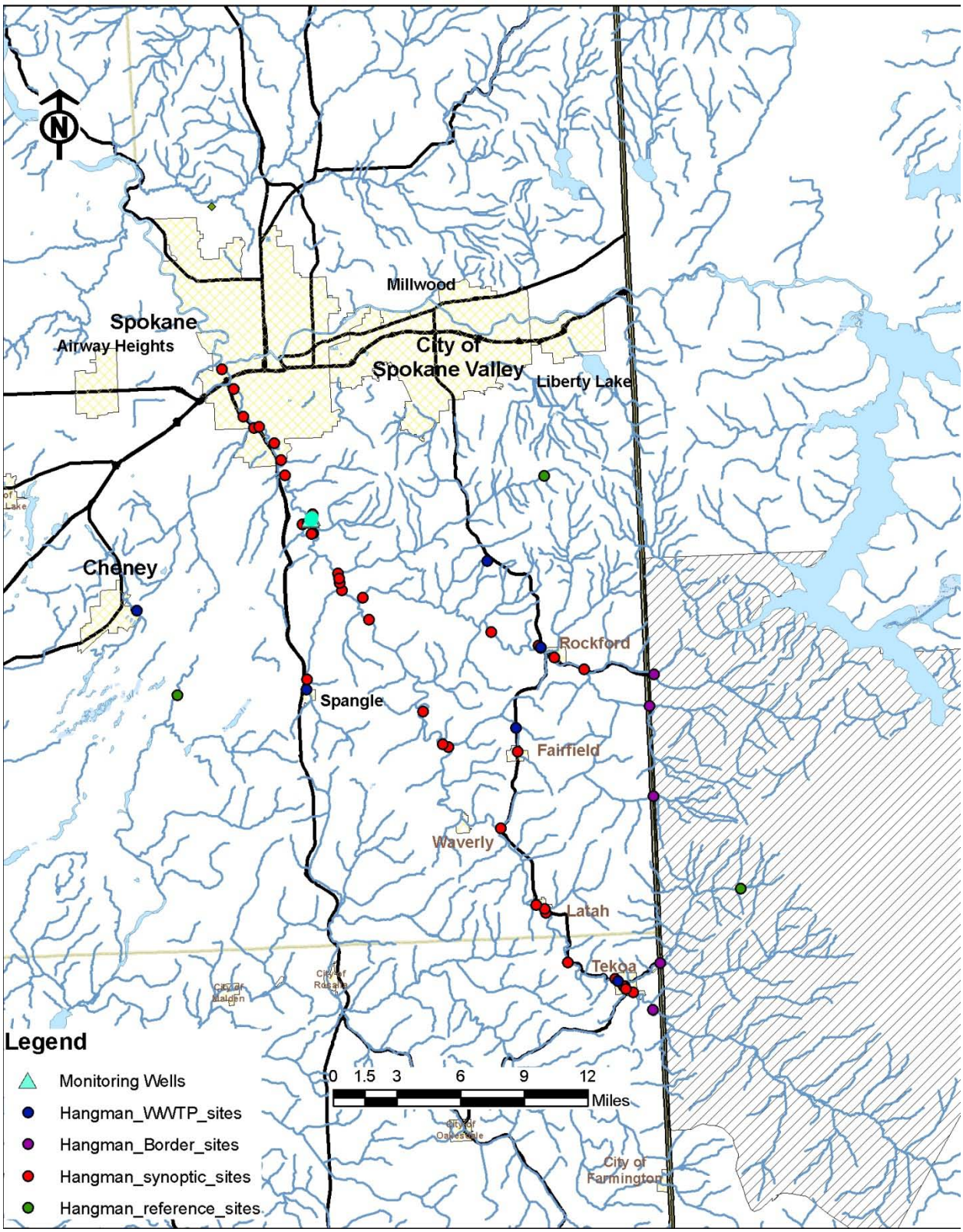

Figure 1. TMDL sampling sites in the Hangman Creek watershed.

Data Quality

Ecology calibrated all field monitoring equipment according to manufacturer's specifications and pre-calibrated and post-checked Hydrolab® meters with certified standards.

Ecology took replicate field samples for laboratory parameter analyses. Field replicates are two samples collected from the same location at the same time. Ecology collects field replicates to check the precision of the entire process of sampling and analysis. The percentage of replicates taken per parameter can be seen in Table 4. Both the frequency of field replicates and precision of the replicated samples met criteria with the exception of Hydrolab-collected data (pH, conductivity, temperature, and DO). Field crews were remiss at collecting replicate readings from the Hydrolabs for a good portion of the study. Those taken were well within criteria.

Table 4. Laboratory and field replicate summary showing relative percent deviation (RPD) and relative standard deviation (RSD) statistics.

Parameter	Number Samples	Number Replicates	% Replicated	Average RPD	Average RSD	Precision Target (RSD)
Laboratory						
Ammonia as Nitrogen	469	54	13.0%	6.77%	5.84%	10%
Nitrate-Nitrite as Nitrogen	469	54	13.0%	4.55%	3.46%	10%
Orthophosphate	475	54	12.8%	5.70%	5.12%	10%
Total Persulfate Nitrogen	469	54	13.0%	6.72%	5.29%	10%
Total Phosphorus	469	54	13.0%	7.27%	6.32%	10%
Total Suspended Solids	278	34	13.9%	11.41%	9.83%	10%
Alkalinity, Total	467	54	13.1%	0.65%	0.46%	10%
Chloride	467	54	13.1%	2.08%	1.51%	5%
Dissolved Organic Carbon	471	54	13.0%	5.14%	4.54%	10%
Total Organic Carbon	468	54	13.0%	4.10%	3.09%	10%
Biological Oxygen Demand	30	6	25.0%	8.33%	7.86%	25%
Field						
Conductivity	392	13	3.4%	0.26%	0.18%	10%
pH	392	13	3.4%	0.69%	0.49%	±0.2 pH units
Temperature	392	13	3.4%	0.68%	0.48%	±0.3° C
Hydrolab DO	389	13	3.5%	0.96%	0.68%	20%
Flow	279	35	12.5%	7.98%	5.64%	-
Hydrolab vs. Winkler	389	139	35.7%	2.00%	1.42%	5%

Ecology's Manchester Environmental Laboratory SOP calls for duplicating a minimum of 5% of all samples (1/20 samples or 1/analytical batch). That goal was met for all parameters. Duplicate precision was also met for all parameters. (Table 5)

Table 5. Laboratory duplicate summary showing relative percent deviation (RPD) and relative standard deviation (RSD) statistics.

Parameter	Number Duplicates	Average RPD	Average RSD	Target RSD
Alkalinity	54	0.65	0..46%	10
Biological Oxygen Demand	6	nc	nc	
Dissolved Organic Carbon	54	6.41	4.54	10
Chloride	54	2.14	1.51%	5
Ammonia-Nitrogen	54	8.26	5.84%	10
Nitrite/Nitrate-Nitrogen	54	4.90	3.46%	10
Orthophosphorus	54	3.30	4.37%	10
Total Organic Carbon	54	4.37	3.09%	10
Total Phosphorus	54	6.12	4.33%	10
Total Persulfate Nitrogen	54	7.48	5.29%	10
Total Suspended Solids	34	13.90	9.83%	10

nc: BOD was not calculated because all sample results were below detection limits.

Ecology compared Hydrolab® DO grab sample results to Winkler titration results using percent relative standard deviation (RSD) (Table 4). The average RSD was 1.42%, with only 8 of 139 replicated samples exceeding 5% RSD. Datalogger graphs show where Ecology checked DO for accuracy by performing Winkler titrations (Appendix E).

Conductivity and pH checks were generally within the specified target accuracy. Two conductivity post-calibrations failed and were rejected. Both were from the September 2009 synoptic run. Three other conductivity post-cal measurements were slightly outside preferred criteria; therefore, data were qualified. Only three pH post-cal measurements were slightly outside criteria; associated data were qualified.

While the overall bias after post-calibration was only -1.7%, Hydrolab® DO grab results fell outside quality objectives (5% RSD) 35% of the time. Six exceedances resulted in rejected data, 11 resulted in qualified data.

Ecology found it appropriate to correct all continuous datalogger DO values using Winkler results (Appendix E).

The correction of datalogger DO minimizes bias and improves the relationship between datalogger and Winkler DO data, giving a more accurate picture of the sites' diel DO characteristics. Hydrolab® DO grab data reported in this publication have not been corrected (Appendix C).

Results

All data collected during the 2008-09 *Hangman Creek DO, pH, and Nutrients TMDL Study* are arranged by site and date and presented in the following appendices:

- Appendix B describes sample locations.
- Appendix C contains field meter and Winkler DO measurements.
- Appendix D lists laboratory data provided by Manchester laboratory.
- Appendix E shows continuous temperature plots collected using On-Site Tidbits.
- Appendix F contains streamflow measurements.
- Appendix G plots of pH, temperature, DO, and conductivity as collected from diel deployment of Hydrolab Multiprobe DataSondes®.
- Appendix H summarizes case narratives provided by Manchester Laboratory.

All data in Appendices B, C, D, and E are available from Ecology's Environmental Information Management (EIM) online database located at www.ecy.wa.gov/eim/. Results may be accessed by searching EIM using the User Study ID JJOY0005 or the Study Name Hangman Creek Dissolved Oxygen and pH TMDL.

Manchester Laboratory performed all laboratory analyses within specified holding times using appropriate quality assurance measures unless noted with qualifier codes (Table 6). Qualifiers place specific conditions on the laboratory data. Data reported with qualifiers should be used with caution, and data variability must be taken into consideration when interpreting results and applying data to other analyses. All other data reported by Manchester Laboratory may be used without qualification. Appendix H contains summaries of Manchester-provided case narratives where explanations of qualified data are necessary.

Table 6. Data qualifier codes.

Qualifier	Definition
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
U	The analyte was not detected at or above the reported sample quantitation limit.
UJ	The analyte was not detected at or above the reported sample quantitation limit. The reported quantitation limit is approximate.
E	The reported result is an estimate because it exceeds the calibration range.
G	The value is likely greater than the result reported; result is an estimated minimum value.
Y	Value is a replicate taken in a side-by-side method in the field.

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Appendices

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Appendix A. Glossary, Acronyms, and Abbreviations

Glossary

Clean Water Act: A federal act passed in 1972 that contains provisions to restore and maintain the quality of the nation's waters. Section 303(d) of the Clean Water Act establishes the TMDL program.

Conductivity: A measure of water's ability to conduct an electrical current. Conductivity is related to the concentration and charge of dissolved ions in water.

Diel: Of, or pertaining to, a 24-hour period.

Dissolved oxygen (DO): A measure of the amount of oxygen dissolved in water.

Eutrophication: An increase in productivity resulting from nutrient loads from human conditions such as fertilizer runoff and leaky septic systems.

Load allocation: The portion of a receiving waters' loading capacity attributed to one or more of its existing or future sources of nonpoint (diffuse) pollution or to natural background sources.

Nutrient: Substance such as carbon, nitrogen, and phosphorus used by organisms to live and grow. Too many nutrients in the water can promote algal blooms and rob the water of oxygen vital to aquatic organisms.

Parameter: Water quality constituent being measured (analyte). A physical, chemical, or biological property whose values determine environmental characteristics or behavior.

pH: A measure of the acidity or alkalinity of water. A low pH value (0 to 7) indicates that an acidic condition is present, while a high pH (7 to 14) indicates a basic or alkaline condition. A pH of 7 is considered to be neutral. Since the pH scale is logarithmic, a water sample with a pH of 8 is ten times more basic than one with a pH of 7.

Pollution: Such contamination, or other alteration of the physical, chemical, or biological properties, of any waters of the state. This includes change in temperature, taste, color, turbidity, or odor of the waters. It also includes discharge of any liquid, gaseous, solid, radioactive, or other substance into any waters of the state. This definition assumes that these changes will, or are likely to, create a nuisance or render such waters harmful, detrimental, or injurious to (1) public health, safety, or welfare, or (2) domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses, or (3) livestock, wild animals, birds, fish, or other aquatic life.

Salmonid: Any fish that belong to the family *Salmonidae*. Basically, any species of salmon, trout, or char. www.fws.gov/le/ImpExp/FactSheetSalmonids.htm

Surface waters of the state: Lakes, rivers, ponds, streams, inland waters, salt waters, wetlands and all other surface waters and water courses within the jurisdiction of Washington State.

Synoptic survey: Data collected simultaneously or over a short period of time.

Total Maximum Daily Load (TMDL): Water cleanup plan. A distribution of a substance in a waterbody designed to protect it from exceeding water quality standards. A TMDL is equal to the sum of all of the following: (1) individual wasteload allocations for point sources, (2) the load allocations for nonpoint sources, (3) the contribution of natural sources, and (4) a Margin of Safety to allow for uncertainty in the wasteload determination. A reserve for future growth is also generally provided.

Wasteload allocation: The portion of a receiving water's loading capacity allocated to existing or future point (discrete) sources of pollution. Wasteload allocation constitutes one type of water quality-based effluent limitation.

Watershed: A drainage area or basin in which all land and water areas drain or flow toward a central collector such as a stream, river, or lake at a lower elevation.

303(d) list: Section 303(d) of the federal Clean Water Act requires Washington State to periodically prepare a list of all surface waters in the state for which beneficial uses of the water – such as for drinking, recreation, aquatic habitat, and industrial use – are impaired by pollutants. These are water quality limited estuaries, lakes, and streams that fall short of state surface water quality standards, and are not expected to improve within the next two years.

Acronyms and Abbreviations

$CaCO_3$	Calcium carbonate
DO	(See Glossary above)
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
GC	Golf Course
LS	Little Spokane
RPD	Relative percent difference
RSD	Relative standard deviation
SOP	Standard operating procedures
TMDL	(See Glossary above)
WAC	Washington Administrative Code
WWTP	Wastewater treatment plant

Units of Measurement

°C	degrees centigrade
cfs	cubic feet per second
ft	feet
g	gram, a unit of mass
kg	kilograms, a unit of mass equal to 1,000 grams.
m	meter
mg	milligrams
mg/L	milligrams per liter (parts per million)
mL	milliliters
NTU	nephelometric turbidity units

s.u.	standard units
ug/L	micrograms per liter (parts per billion)
umhos/cm	micromhos per centimeter
uS/cm	microsiemens per centimeter
ww	wet weight

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Appendix B. Sample Locations

Table B-1. Sample locations.

Location ID	Location Name	Latitude	Longitude	Border/Ref	synoptic	storm
34PHI-01.6	Phillips Creek at Cheney - Spangle Rd.	47.43406	-117.513	R		X
55BEA-03.7	Bear Creek at Deer Park - Milan Rd.	47.96442	-117.372	R		
55GRI-00.5	Griffith Spring above LS Fish Hatchery	47.62519	-117.503	R		X
56A070	Hangman Creek at mouth	47.65461	-117.4544		X	X
56A200	Hangman Creek at Bradshaw Rd.	47.39292	-117.2468		X	X
56BLA-00.0	Dummy Site for blank samples	47.62519	-117.503		X	
56CAL-00.1	California Creek at mouth	47.5127	-117.3469		X	X
56CAL-12.2	California Creek at end of Belmont Rd.	47.57321	-117.1353	R		X
56COV-00.2	Cove Creek at mouth	47.2787	-117.1532		X	
56FAIWWTP	Fairfield WWTP	47.40285	-117.174			X
56FREWTP	Freeman School District WWTP	47.51709	-117.196			
56HAN-01.9	Hangman Creek at Chestnut St.	47.64092	-117.444		X	
56HAN-03.6	Hangman Creek at Kampa Bridge	47.621942	-117.4356		X	
56HAN-04.6	Hangman Creek Below Qualchan GC	47.6147	-117.4200		X	
56HAN-06.2	Hangman Creek at Qualchan GC	47.59159	-117.399		X	X
56HAN-07.8	Hangman Creek at Campion Park	47.59159	-117.3993		X	
56HAN-08.9	Hangman Creek at Yellowstone Pipeline	47.5812	-117.3959		X	
56HAN-12.6	Hangman Creek below Hangman Hills WWTP	47.5539	-117.3697		X	
56HAN-13.2	Hangman Creek above Hangman Hills WWTP	47.5480	-117.3755		X	
56HAN-13.5	Hangman Creek at Hangman Valley GC	47.5470	-117.3803		X	
56HAN-14.5	Hangman Creek above Hangman Valley GC	47.5403	-117.3718		X	
56HAN-18.8	Hangman Creek just below Duncan	47.5093	-117.346		X	X
56HAN-19.1	Hangman Creek at Duncan	47.50642	-117.3452		X	
56HAN-21.8	Hangman Creek at Latah Creek Rd.	47.48051	-117.3177		X	
56HAN-29.3	Hangman Creek at Keevey Rd	47.4166	-117.2671		X	
56HAN-41.2	Hangman Creek at Roberts Rd.	47.33502	-117.1936		X	X
56HAN 46.3	Hangman Creek at Spring Valley Rd.	47.2817	-117.1616		X	
56HAN-47.0	Hangman Creek at Marsh Rd.	47.276	-117.1525		X	
56HAN-50.5	Hangman Creek at Fairbanks Rd.	47.2417	-117.1326		X	
56HAN-54.3	Hangman Creek below Tekoa	47.22899	-117.0859		X	X
56HAN-54.9	Hangman Creek at Tekoa	47.22401	-117.0776		X	
56HAN-55.1	Hangman Creek above Little Hangman Creek	47.22204	-117.075		X	X
56HAN-55.8	Hangman Creek above Tekoa	47.21951	-117.0684		X	
56HAN-57.7	Hangman Creek at state line with Idaho	47.20685	-117.0492	B	X	X
56LIT-00.0	Little Hangman Creek at mouth	47.22407	-117.0767		X	
56LIT-02.3	Little Hangman Creek at State Line Rd.	47.23862	-117.0399	B		X
56MAR-00.0	Marshall Creek at mouth	47.61414	-117.4253		X	X

Location ID	Location Name	Latitude	Longitude	Border/Ref	synoptic	storm
56MAR-05.3	Marshall Creek at McKenzie Rd.	47.56454	-117.4938		X	
56NFR-03.8	N. Fork Rock Creek at state line with Idaho	47.43496	-117.0334	B		X
56RAT-00.1	Rattler Run at mouth	47.39377	-117.2483		X	X
56RAT-05.7	Rattler Run above Fairfield WWTP	47.3867	-117.1737		X	
56ROC-00.5	Rock Creek at mouth	47.49555	-117.3228		X	X
56ROC-08.9	Rock Creek at Jackson Rd.	47.46856	-117.195		X	
56ROC-12.5	Rock Creek below WWTP	47.4581	-117.1482		X	
56ROC-13.7	Rock Creek at Rockford	47.44965	-117.1327		X	
56ROC-15.4	Rock Creek below North Fork	47.4405	-117.1037		X	
56ROC-25.9	Rock Creek at Idaho Rd.	47.35241	-117.0396	B		X
56ROCGWD	Rockford WWTP Groundwater Discharge	47.45668	-117.146			
56ROCWWTP	Rockford WWTP	47.45647	-117.146			X
56ROS-01.7	Rose Creek at state line with Idaho	47.41369	-117.0396	B		X
56SPA-00.0	Spangle Creek at mouth	47.50112	-117.3435		X	X
56SPA-05.2	Spangle Creek at Watt Rd.	47.4416	-117.3822			
56SPA-WTP	Spangle WWTP	47.43458	-117.3831			X
56STE-00.0	Stevens Creek at mouth	47.5408	-117.370		X	
56TEKWWTP	Tekoa WWTP	47.22773	-117.0829			X
56UNK(LIT-08.6)	Unknown drainage at Agency Rd.	47.28674	-116.956	R		X
56-HHWTP-MW1	Hangman Hills WTP Monitoring Well #1	47.55064	-117.3715		X	
56-HHWTP-MW2	Hangman Hills WTP Monitoring Well #2	47.54979	-117.3718		X	
56-HHWTP-MW3	Hangman Hills WTP Monitoring Well #3	47.55166	-117.3705		X	

GC: Golf Course
LS: Little Spokane
WWTP: Wastewater Treatment Plant

Appendix C. Field data

Table C-1. Field data.

Location ID	Location Name	Date	Time	Cond uS/cm	pH	Temp deg C	Hydrolab DO mg/L	Winkler DO mg/L
34PHI-01.6	Phillips Creek at Cheney - Spangle Rd.	3/4/2009	8:16:00	150.6	6.67	1.04	7.15	7.01
34PHI-01.6	Phillips Creek at Cheney - Spangle Rd.	3/18/2009	8:00:00	229.7	7.52	3.26	10.93	
34PHI-01.6	Phillips Creek at Cheney - Spangle Rd.	3/31/2009	13:19:00	223	7.75	5.82	10.66	10.4
34PHI-01.6	Phillips Creek at Cheney - Spangle Rd.	4/15/2009	9:20:00	238.5	7.39	7.99	8.59	
34PHI-01.6	Phillips Creek at Cheney - Spangle Rd.	5/5/2009	14:47:00	304.8	7.7	15.9	9.14	9.09
34PHI-01.6	Phillips Creek at Cheney - Spangle Rd.	5/20/2009	9:58:00	325	7.18	13.98	3.96	
34PHI-01.6	Phillips Creek at Cheney - Spangle Rd.	6/2/2009	14:10:00	357.8	7.17	19.9	3.96	3.95
55BEA-03.7	Bear Creek at Deer Park - Milan Rd.	10/28/2008	14:20:00	300	7.64	4.69	11.3	11.02
55BEA-03.7	Bear Creek at Deer Park - Milan Rd.	11/18/2008	13:30:00	306	7.61	3.8	11.17	11.4
55BEA-03.7	Bear Creek at Deer Park - Milan Rd.	1/20/2009	15:35:00	326	6.99	-0.01	0.5	0.5
55GRI-00.5	Griffith Spring above LS Fish Hatchery	2/9/2009	13:25:00	376.6	8.12	10.76	8.12	
55GRI-00.5	Griffith Spring above LS Fish Hatchery	2/23/2009	14:00:00	347.1	8.13	10.9	7.39	
55GRI-00.5	Griffith Spring above LS Fish Hatchery	2/25/2009	11:44:00	343.1	7.97	10.89	7.08	
55GRI-00.5	Griffith Spring above LS Fish Hatchery	3/11/2009	12:44:00	345.3	7.77	10.97	7.56	
55GRI-00.5	Griffith Spring above LS Fish Hatchery	3/24/2009	9:57:00	347	8.05	10.9	7.5	
55GRI-00.5	Griffith Spring above LS Fish Hatchery	4/6/2009	12:50:00	350	8.03	11.06	7.85	
55GRI-00.5	Griffith Spring above LS Fish Hatchery	4/20/2009	12:20:00	353.5	7.99	11.12	7.84	
55GRI-00.5	Griffith Spring above LS Fish Hatchery	5/4/2009	13:20:00	347.1	7.98	10.99	7.3	
55GRI-00.5	Griffith Spring above LS Fish Hatchery	5/18/2009	13:05:00	357	7.78	11.1	7.68	
55GRI-00.5	Griffith Spring above LS Fish Hatchery	6/1/2009	13:00:00	355.9	7.73	11.1	7.58	
55GRI-00.5	Griffith Spring above LS Fish Hatchery	6/15/2009	13:10:00	356.1	7.77	11.08	7.6	
55GRI-00.5	Griffith Spring above LS Fish Hatchery	7/6/2009	13:17:00	358.8	7.75	11.09	7.68	
55GRI-00.5	Griffith Spring above LS Fish Hatchery	7/13/2009	12:40:00	325.9	7.85	10.9	7.17	
55GRI-00.5	Griffith Spring above LS Fish Hatchery	8/3/2009	13:42:00	349.4	7.66	11.23	7.69	
55GRI-00.5	Griffith Spring above LS Fish Hatchery	8/17/2009	10:53:00	348.3	7.68	10.96	7.52	
55GRI-00.5	Griffith Spring above LS Fish Hatchery	9/8/2009	11:40:00	355.2	7.68	11.03	7.4	
55GRI-00.5	Griffith Spring above LS Fish Hatchery	9/22/2009	11:25:00	353	7.69	11.08	7.32	
55GRI-00.5	Griffith Spring above LS Fish Hatchery	9/22/2009	11:54:00	354	7.69	11.1	7.33	
56A070	Hangman Creek at mouth	9/17/2008	11:01:00	387	8.43	12.44	11.64	
56A070	Hangman Creek at mouth	9/17/2008	17:40:00	370	8.91	16.33	14.28	
56A070	Hangman Creek at mouth	2/25/2009	13:15:00	141	7.46	1.94	12	12.02
56A070	Hangman Creek at mouth	2/25/2009	16:40:00	140	7.49	2.07	11.95	
56A070	Hangman Creek at mouth	6/24/2009	12:15:00	327	8.54	18.25	10.64	10.71
56A070	Hangman Creek at mouth	6/24/2009	17:05:00	327	8.71	21.25	10.09	
56A070	Hangman Creek at mouth	7/29/2009	12:04:00	393.4	8.47	21.42	11.35	
56A070	Hangman Creek at mouth	7/29/2009	16:55:00	374.2	8.94	24.62	13.6	
56A200	Hangman Creek at Bradshaw Rd.	9/16/2008	13:21:00	261	8.82	14.82	10.51	
56A200	Hangman Creek at Bradshaw Rd.	9/16/2008	16:30:00	250	8.98	16.15	12.89	
56A200	Hangman Creek at Bradshaw Rd.	2/24/2009	12:20:00	145.9	7.78	3.27	11.59	
56A200	Hangman Creek at Bradshaw Rd.	2/24/2009	16:15:00	139.8	7.79	3.35	11.53	11.59
56A200	Hangman Creek at Bradshaw Rd.	6/23/2009	11:55:00	207	8.28	17.54	10.09	
56A200	Hangman Creek at Bradshaw Rd.	6/23/2009	16:30:00	216.9	8.49	19.66	10.55	10.56
56A200	Hangman Creek at Bradshaw Rd.	7/28/2009	12:10:00	258.6	7.85	24.98	6.52	
56A200	Hangman Creek at Bradshaw Rd.	7/28/2009	16:25:00	257.8	8.14	25.88	8.67	8.95
56CAL-00.1	California Creek at mouth	2/25/2009	10:10:00	150.1	8.04	1.24	12.85	
56CAL-00.1	California Creek at mouth	2/25/2009	15:30:00	151	7.98	1.58	12.69	
56CAL-00.1	California Creek at mouth	6/23/2009	11:55:00	260	8.15	12.88	9.88	
56CAL-00.1	California Creek at mouth	6/23/2009	17:20:00	262	8.08	14.66	8.98	
56CAL-00.1	California Creek at mouth	7/28/2009	12:47:00	299.5	8.01	19.11	8.25	
56CAL-00.1	California Creek at mouth	7/28/2009	13:19:00	299.4	8.02	19.14	8.27	
56CAL-00.1	California Creek at mouth	7/28/2009	17:00:00	299	7.98	20.16	7.83	

Location ID	Location Name	Date	Time	Cond uS/cm	pH	Temp deg C	Hydrolab DO mg/L	Winkler DO mg/L
56CAL-12.2	California Creek at end of Belmont Rd.	1/20/2009	12:00:00	35	7.18	0.66	12.51	12.4
56CAL-12.2	California Creek at end of Belmont Rd.	2/17/2009	12:50:00	36.4	7.88	1.04	12.13	12.06
56CAL-12.2	California Creek at end of Belmont Rd.	2/25/2009	8:55:00	35.2	7.49	1.68	12.17	
56CAL-12.2	California Creek at end of Belmont Rd.	2/25/2009	14:30:00	33.3	7.45	1.44	12.24	
56CAL-12.2	California Creek at end of Belmont Rd.	3/4/2009	16:35:00	31.7	7.06	1.77	11.9	11.9
56CAL-12.2	California Creek at end of Belmont Rd.	3/17/2009	15:53:00	32.8	7.34	1.53	12.18	
56CAL-12.2	California Creek at end of Belmont Rd.	4/1/2009	15:38:00	30.9	7.18	2.11	11.96	12.39
56CAL-12.2	California Creek at end of Belmont Rd.	4/14/2009	15:24:00	26.2	6.78	3.73	11.41	11.55
56CAL-12.2	California Creek at end of Belmont Rd.	5/6/2009	17:04:00	27.5	7.31	6	10.77	10.9
56CAL-12.2	California Creek at end of Belmont Rd.	5/20/2009	14:38:00	30.3	7.18	7.76	10.31	
56CAL-12.2	California Creek at end of Belmont Rd.	6/3/2009	15:34:00	34.7	7.29	12.33	9.39	9.33
56CAL-12.2	California Creek at end of Belmont Rd.	6/3/2009	15:34:00	34.6	7.25	12.35	9.39	
56CAL-12.2	California Creek at end of Belmont Rd.	6/17/2009	13:05:00	38.8	7.18	11.97	9.67	9.8
56CAL-12.2	California Creek at end of Belmont Rd.	7/15/2009	16:15:00	46.1	7.29	13.97	8.98	9.1
56CAL-12.2	California Creek at end of Belmont Rd.	8/19/2009	14:20:00	69.5	6.63	14.61	6.76	7.19
56COV-00.2	Cove Creek at mouth	9/16/2008	11:20:00	292	8.08	8.35	9.3	9.99
56COV-00.2	Cove Creek at mouth	9/16/2008	15:37:00	292	8.19	11.34	10	10.15
56COV-00.2	Cove Creek at mouth	6/22/2009	9:40:00	307	7.87	11.18	9.44	
56COV-00.2	Cove Creek at mouth	6/22/2009	14:30:00	309	7.98	12.42	9.55	9.15
56COV-00.2	Cove Creek at mouth	7/27/2009	10:10:00	331	7.78	16	7.87	7.52
56COV-00.2	Cove Creek at mouth	7/27/2009	14:50:00	330	7.97	19	8.12	7.98
56FAIWTP	Fairfield WTP	2/18/2009	13:35:00	539	7.52	1.18	6.7	
56FAIWTP	Fairfield WTP	2/24/2009	13:20:00	468	7.01	1.6	8.8	
56FAIWTP	Fairfield WTP	3/18/2009	13:20:00	453	8.32	3.16	16.2	16.2
56FAIWTP	Fairfield WTP	4/15/2009	15:40:00	380.7	9.73	11.86	19.95	20.41
56FAIWTP	Fairfield WTP	5/20/2009	13:54:00	512	8.25	14.59	10.93	10.89
56FREWTP	Freeman School District WWTP	2/18/2009	16:00:00	604	7.55	1.71	4.85	
56FREWTP	Freeman School District WWTP	3/18/2009	14:23:00	483	7.43	1.24	3.87	
56FREWTP	Freeman School District WWTP	4/15/2009	16:35:00	516.2	7.14	5.02	4.58	
56HAN-01.9	Hangman Creek at Chestnut St.	9/17/2008	11:15:00	376	8.47	13.33	12.37	
56HAN-01.9	Hangman Creek at Chestnut St.	9/17/2008	17:25:00	367	8.65	16.31	11.95	
56HAN-01.9	Hangman Creek at Chestnut St.	6/24/2009	11:23:00	322	8.46	17.96	10.22	
56HAN-01.9	Hangman Creek at Chestnut St.	6/24/2009	16:23:00	321	8.63	20.85	10.1	10.02
56HAN-01.9	Hangman Creek at Chestnut St.	7/29/2009	11:14:00	383.8	8.49	21.14	11.1	11.52
56HAN-01.9	Hangman Creek at Chestnut St.	7/29/2009	15:30:00	372.6	8.72	23.5	11.98	11.93
56HAN-01.9	Hangman Creek at Chestnut St.	7/29/2009	16:20:00	371.4	8.72	23.5	11.92	
56HAN-03.6	Hangman Creek at Kampa Bridge	6/24/2009	10:34:00	304	8.32	18.01	9.61	
56HAN-03.6	Hangman Creek at Kampa Bridge	6/24/2009	15:40:00	303	8.48	21.54	9.99	
56HAN-03.6	Hangman Creek at Kampa Bridge	7/29/2009	10:33:00	369	8.09	21.37	8.27	
56HAN-03.6	Hangman Creek at Kampa Bridge	7/29/2009	14:45:00	364.2	8.42	23.79	10.56	
56HAN-04.6	Hangman Creek below Qualchan GC	6/24/2009	9:24:00	301	8.21	18.14	8.69	
56HAN-04.6	Hangman Creek below Qualchan GC	6/24/2009	14:28:00	297	8.36	21.37	9.39	
56HAN-04.6	Hangman Creek below Qualchan GC	7/29/2009	9:35:00	387	8.14	22.68	7.57	
56HAN-04.6	Hangman Creek below Qualchan GC	7/29/2009	13:48:00	378.9	8.48	25.27	10.72	
56HAN-06.2	Hangman Creek at Qualchan GC	2/25/2009	9:50:00	140	7.32	1.71	11.98	12.04
56HAN-06.2	Hangman Creek at Qualchan GC	2/25/2009	17:35:00	138	7.43	2.13	11.89	11.98
56HAN-06.2	Hangman Creek at Qualchan GC	6/24/2009	12:24:00	286.6	7.89	18.88	7.34	
56HAN-06.2	Hangman Creek at Qualchan GC	6/24/2009	17:10:00	285.7	7.87	20.23	7.29	
56HAN-06.2	Hangman Creek at Qualchan GC	7/29/2009	12:15:00	360	8.42	25.06	9.1	
56HAN-06.2	Hangman Creek at Qualchan GC	7/29/2009	16:26:00	357	8.55	26.61	9.63	
56HAN-07.8	Hangman Creek at Campion Park	9/17/2008	12:28:00	342	8.34	15.18	10	10.45
56HAN-07.8	Hangman Creek at Campion Park	9/17/2008	16:31:00	336	8.57	16.84	12.18	
56HAN-08.9	Hangman Creek at Yellowstone Pipeline	6/24/2009	11:02:00	266.3	7.72	18.23	6.61	
56HAN-08.9	Hangman Creek at Yellowstone Pipeline	6/24/2009	11:02:00	266.5	7.7	18.02	6.58	6.64
56HAN-08.9	Hangman Creek at Yellowstone Pipeline	6/24/2009	16:14:00	270.9	7.79	22.02	6.89	6.79
56HAN-08.9	Hangman Creek at Yellowstone Pipeline	7/29/2009	11:20:00	348	8.13	24.91	6.81	6.62
56HAN-08.9	Hangman Creek at Yellowstone Pipeline	7/29/2009	15:37:00	344	8.44	27.23	9.42	9.27

Location ID	Location Name	Date	Time	Cond uS/cm	pH	Temp deg C	Hydrolab DO mg/L	Winkler DO mg/L
56HAN-12.6	Hangman Creek blw Hangman Hills WWTP	7/29/2009	10:30:00	341	7.97	24.32	6.72	
56HAN-12.6	Hangman Creek blw Hangman Hills WWTP	7/29/2009	14:51:00	336	8.32	25.85	9.63	
56HAN-13.2	Hangman Creek abv Hangman Hills WWTP	6/24/2009	9:03:00	280.7	7.75	17.4	7.06	
56HAN-13.2	Hangman Creek abv Hangman Hills WWTP	6/24/2009	14:40:00	286.1	7.84	20	8.03	
56HAN-13.2	Hangman Creek abv Hangman Hills WWTP	7/29/2009	9:26:00	326	8.19	24.3	8.13	7.95
56HAN-13.2	Hangman Creek abv Hangman Hills WWTP	7/29/2009	14:03:00	328	8.41	26.15	10.01	
56HAN-14.5	Hangman Creek abv Hangman Valley GC	6/24/2009	8:15:00	276.4	7.75	16.46	7.08	
56HAN-14.5	Hangman Creek abv Hangman Valley GC	6/24/2009	13:51:00	276.2	7.9	19.56	8.06	
56HAN-14.5	Hangman Creek abv Hangman Valley GC	7/29/2009	8:25:00	326	8.03	22.96	8.41	
56HAN-14.5	Hangman Creek abv Hangman Valley GC	7/29/2009	8:40:00	322	8.04	22.95	8.2	
56HAN-14.5	Hangman Creek abv Hangman Valley GC	7/29/2009	13:23:00	314	8.4	24.23	10.52	
56HAN-18.8	Hangman Creek just below Duncan	2/25/2009	11:40:00	140.2	7.72	2.12	12.41	
56HAN-18.8	Hangman Creek just below Duncan	2/25/2009	16:30:00	145.4	7.94	2.46	12.21	
56HAN-19.1	Hangman Creek at Duncan	9/17/2008	13:13:00	271	8.45	18.79	11.07	
56HAN-19.1	Hangman Creek at Duncan	9/17/2008	16:05:00	269	8.64	20.35	10.85	
56HAN-19.1	Hangman Creek at Duncan	6/23/2009	11:10:00	259	8.01	15.57	8.8	
56HAN-19.1	Hangman Creek at Duncan	6/23/2009	16:55:00	258	8.23	18.32	9.13	9.16
56HAN-19.1	Hangman Creek at Duncan	7/28/2009	11:50:00	283.9	8.02	24	7.21	
56HAN-19.1	Hangman Creek at Duncan	7/28/2009	16:27:00	281.6	8.38	28.5	9.23	9.18
56HAN-21.8	Hangman Creek at Latah Creek Rd.	9/17/2008	9:51:00	263	8.07	13.15	9	
56HAN-21.8	Hangman Creek at Latah Creek Rd.	9/17/2008	15:17:00	260	8.69	18.23	11.72	11.45
56HAN-21.8	Hangman Creek at Latah Creek Rd.	6/23/2009	8:40:00	225	7.91	12.85	9.22	
56HAN-21.8	Hangman Creek at Latah Creek Rd.	6/23/2009	14:05:00	224	8.5	19.84	10.26	10.27
56HAN-21.8	Hangman Creek at Latah Creek Rd.	7/28/2009	10:10:00	275.4	7.85	23.18	6.85	
56HAN-21.8	Hangman Creek at Latah Creek Rd.	7/28/2009	15:13:00	270	8.32	27.94	8.99	8.95
56HAN-29.3	120' upstream of bridge	6/23/2009	13:00:00	214.5	8.33	18.67	8.8	
56HAN-29.3	120' upstream of bridge	6/23/2009	17:05:00	215.5	8.32	20.68	8.16	8.09
56HAN-29.3	120' upstream of bridge	7/28/2009	8:25:00	259	7.98	21.25	7.59	7.6
56HAN-29.3	120' upstream of bridge	7/28/2009	13:53:00	253.7	8.47	27.07	7.92	
56HAN-41.2	Hangman Creek at Roberts Rd.	9/16/2008	11:54:00	243	8.54	16.18	9.88	9.6
56HAN-41.2	Hangman Creek at Roberts Rd.	9/16/2008	16:00:00	243	8.65	18.57	10.54	10.4
56HAN-41.2	Hangman Creek at Roberts Rd.	2/24/2009	11:22:00	160.6	7.63	1.93	11.82	
56HAN-41.2	Hangman Creek at Roberts Rd.	2/24/2009	15:24:00	162.8	7.58	1.7	11.97	
56HAN-41.2	Hangman Creek at Roberts Rd.	6/22/2009	11:30:00	198	8.44	16.37	10.41	10.65
56HAN-41.2	Hangman Creek at Roberts Rd.	6/22/2009	15:50:00	198	8.67	16.96	11.56	11.6
56HAN-41.2	Hangman Creek at Roberts Rd.	7/27/2009	11:55:00	244	8.13	24.38	7.88	8.1
56HAN-41.2	Hangman Creek at Roberts Rd.	7/27/2009	16:10:00	242	8.42	25.8	9.79	9.55
56HAN-46.3	Hangman Creek at Spring Valley Rd	6/22/2009	10:25:00	185	7.96	16.03	8.84	
56HAN-46.3	Hangman Creek at Spring Valley Rd	6/22/2009	15:00:00	184	8.33	17.61	10.05	
56HAN-46.3	Hangman Creek at Spring Valley Rd	7/27/2009	10:50:00	237	7.79	23.9	6.99	
56HAN-46.3	Hangman Creek at Spring Valley Rd	7/27/2009	15:25:00	230	7.97	26.3	7.78	
56HAN-47.0	Hangman Creek at Marsh Rd.	6/22/2009	8:45:00	174	7.94	16.31	8.67	8.75
56HAN-47.0	Hangman Creek at Marsh Rd.	6/22/2009	14:05:00	174	8.27	17.57	9.76	
56HAN-47.0	Hangman Creek at Marsh Rd.	7/27/2009	9:30:00	212	7.86	23.7	7.14	
56HAN-47.0	Hangman Creek at Marsh Rd.	7/27/2009	14:20:00	208	8.53	27.6	10.79	
56HAN-50.5	Hangman Creek at Fairbanks Rd	6/22/2009	13:35:00	169.4	7.7	17.43	8.34	
56HAN-50.5	Hangman Creek at Fairbanks Rd	6/22/2009	17:00:00	169.6	7.77	17.57	8.54	
56HAN-50.5	Hangman Creek at Fairbanks Rd	7/27/2009	8:25:00	211	7.46	22.6	4.16	
56HAN-50.5	Hangman Creek at Fairbanks Rd	7/27/2009	13:35:00	209	8.01	26.5	8.28	
56HAN-54.3	Hangman Creek below Tekoa	9/16/2008	10:46:00	259	7.72	17.73	8.12	8
56HAN-54.3	Hangman Creek below Tekoa	9/16/2008	15:16:00	266	7.99	15.94	10.45	
56HAN-54.3	Hangman Creek below Tekoa	2/24/2009	9:51:00	103	7.76	1.79	11.64	
56HAN-54.3	Hangman Creek below Tekoa	2/24/2009	14:35:00	95.1	7.54	2.38	11.56	11.5
56HAN-54.3	Hangman Creek below Tekoa	6/22/2009	12:52:00	167.5	7.55	17.2	8.02	
56HAN-54.3	Hangman Creek below Tekoa	6/22/2009	16:30:00	168.2	7.61	18.01	8.27	
56HAN-54.3	Hangman Creek below Tekoa	7/27/2009	13:14:00	231.1	7.47	23.66	6.16	6.12
56HAN-54.3	Hangman Creek below Tekoa	7/27/2009	17:10:00	214.2	7.57	25.28	6.83	7.15

Location ID	Location Name	Date	Time	Cond uS/cm	pH	Temp deg C	Hydrolab DO mg/L	Winkler DO mg/L
56HAN-55.1	Hangman Ck above Little Hangman Ck	2/24/2009	10:46:00	73.8	7.02	2.93	10.82	
56HAN-55.8	Hangman Creek above Tekoa	9/16/2008	8:52:00	202	7.63	13.05	7.93	
56HAN-55.8	Hangman Creek above Tekoa	9/16/2008	14:32:00	204	7.79	15.19	8.8	
56HAN-55.8	Hangman Creek above Tekoa	6/22/2009	10:10:00	135.9	7.3	15.86	6.4	
56HAN-55.8	Hangman Creek above Tekoa	6/22/2009	15:05:00	134	7.39	17.59	7.26	
56HAN-55.8	Hangman Creek above Tekoa	7/27/2009	10:54:00	144.7	7.27	21.97	5.53	
56HAN-55.8	Hangman Creek above Tekoa	7/27/2009	15:08:00	144.4	7.47	23.62	7.43	
56HAN-57.7	Hangman Creek at state line	9/16/2008	8:35:00	181	7.65	12.62	7.53	7.3
56HAN-57.7	Hangman Creek at state line	9/16/2008	14:19:00	183	7.77	15.15	8.14	
56HAN-57.7	Hangman Creek at state line	10/29/2008	10:10:00	201	7.69	4.56	9.85	9.88
56HAN-57.7	Hangman Creek at state line	11/19/2008	9:50:00	103	7.06	4.87	8.18	7.6
56HAN-57.7	Hangman Creek at state line	1/21/2009	9:55:00	92.6	7.07	0.09	12.18	12.2
56HAN-57.7	Hangman Creek at state line	2/18/2009	9:25:00	92	7.72	1.75	11.61	
56HAN-57.7	Hangman Creek at state line	2/24/2009	9:38:00	63.5	7.17	2.75	10.94	11.05
56HAN-57.7	Hangman Creek at state line	2/24/2009	14:23:00	63.1	6.8	2.4	11.02	
56HAN-57.7	Hangman Creek at state line	3/4/2009	10:08:00	63.2	6.99	2.98	11.06	
56HAN-57.7	Hangman Creek at state line	3/18/2009	10:45:00	85.9	7.22	2.25	11.65	11.63
56HAN-57.7	Hangman Creek at state line	4/1/2009	8:45:00	83.9	7.17	1.41	11.7	
56HAN-57.7	Hangman Creek at state line	4/15/2009	11:25:00	52.7	7.01	4.55	11.08	
56HAN-57.7	Hangman Creek at state line	5/6/2009	9:48:00	73.6	7.61	7.94	9.41	9.59
56HAN-57.7	Hangman Creek at state line	5/19/2009	15:00:00	72.3	7.76	13.5	9.98	
56HAN-57.7	Hangman Creek at state line	6/3/2009	11:43:00	108	7.65	18.37	8.5	8.58
56HAN-57.7	Hangman Creek at state line	6/17/2009	10:45:00	127	7.24	20.27	6.11	6
56HAN-57.7	Hangman Creek at state line	6/22/2009	9:10:00	124.5	7.38	15.1	7.16	7.18
56HAN-57.7	Hangman Creek at state line	6/22/2009	14:26:00	124.3	7.42	16.23	7.62	7.6
56HAN-57.7	Hangman Creek at state line	7/15/2009	10:35:00	146.7	7.42	18.31	6.67	
56HAN-57.7	Hangman Creek at state line	7/27/2009	8:51:00	147.4	7.31	21.64	6	6.6
56HAN-57.7	Hangman Creek at state line	7/27/2009	13:47:00	148	7.46	23.34	7.52	
56HAN-57.7	Hangman Creek at state line	8/19/2009	9:47:00	184.3	7.03	17.78	5.26	
56HAN-57.7	Hangman Creek at state line	8/19/2009	9:47:00	183.9	7.04	17.81	5.29	
56HAN-57.7	Hangman Creek at state line	9/16/2009	10:55:00	210.5	7.35	16.29	6.55	6.57
56LIT-00.0	Little Hangman Creek at mouth	9/16/2008	9:36:00	275	7.6	12.08	6.34	6.52
56LIT-00.0	Little Hangman Creek at mouth	9/16/2008	14:46:00	274	7.92	15.42	7.86	8.85
56LIT-00.0	Little Hangman Creek at mouth	6/22/2009	12:00:00	266.8	7.82	15.62	8.68	8.68
56LIT-00.0	Little Hangman Creek at mouth	6/22/2009	15:55:00	265	8.09	16.73	10.02	10
56LIT-00.0	Little Hangman Creek at mouth	7/27/2009	12:20:00	286.2	7.72	22.77	6.95	
56LIT-00.0	Little Hangman Creek at mouth	7/27/2009	16:30:00	279.4	8	25.69	8.07	
56LIT-02.3	Little Hangman at state line Rd.	10/29/2008	10:55:00	244	7.8	3.26	10.56	
56LIT-02.3	Little Hangman at state line Rd.	11/19/2008	10:45:00	204	7.49	4.13	9.57	
56LIT-02.3	Little Hangman at state line Rd.	1/21/2009	10:35:00	157.7	6.98	0.09	10.64	
56LIT-02.3	Little Hangman at state line Rd.	2/18/2009	10:55:00	167	7.58	0.97	11.35	11.33
56LIT-02.3	Little Hangman at state line Rd.	2/24/2009	12:25:00	101.6	6.67	0.89	11.33	
56LIT-02.3	Little Hangman at state line Rd.	2/24/2009	15:16:00	97.7	6.61	1.48	11.19	11.26
56LIT-02.3	Little Hangman at state line Rd.	3/4/2009	11:00:00	104.2	7.01	2.93	11.16	11.1
56LIT-02.3	Little Hangman at state line Rd.	3/18/2009	11:25:00	136.5	7.19	1.4	12	
56LIT-02.3	Little Hangman at state line Rd.	4/1/2009	9:25:00	118.3	7.25	0.43	12.09	12
56LIT-02.3	Little Hangman at state line Rd.	4/15/2009	12:50:00	96.7	7.35	7.99	11.59	
56LIT-02.3	Little Hangman at state line Rd.	5/6/2009	11:08:00	138	7.42	8.39	9.2	
56LIT-02.3	Little Hangman at state line Rd.	5/20/2009	11:57:00	164	7.76	12.08	10.6	
56LIT-02.3	Little Hangman at state line Rd.	6/3/2009	12:35:00	217	8.23	18.02	11	
56LIT-02.3	Little Hangman at state line Rd.	6/17/2009	11:30:00	241.6	7.73	17.32	8.77	
56LIT-02.3	Little Hangman at state line Rd.	6/22/2009	10:58:00	241.1	7.76	13.35	9.1	
56LIT-02.3	Little Hangman at state line Rd.	6/22/2009	15:30:00	240.4	8.07	15.09	10.72	
56LIT-02.3	Little Hangman at state line Rd.	7/15/2009	12:10:00	245.4	7.82	17.1	9.32	9.3
56LIT-02.3	Little Hangman at state line Rd.	7/27/2009	11:33:00	260.9	7.66	18.85	7.78	
56LIT-02.3	Little Hangman at state line Rd.	7/27/2009	15:44:00	256.7	8.32	20.26	11.85	
56LIT-02.3	Little Hangman at state line Rd.	8/19/2009	10:46:00	254.9	7.4	15.71	8.42	8.24
56LIT-02.3	Little Hangman at state line Rd.	9/16/2009	11:30:00	256	7.61	13.47	8.34	

Location ID	Location Name	Date	Time	Cond uS/cm	pH	Temp deg C	Hydrolab DO mg/L	Winkler DO mg/L
56MAR-00.0	Marshall Creek at mouth	2/25/2009	10:27:00	256	7.73	4.53	10.45	
56MAR-00.0	Marshall Creek at mouth	2/25/2009	17:10:00	250.5	7.84	5.89	10.06	10.09
56MAR-00.0	Marshall Creek at mouth	6/24/2009	8:37:00	257	7.48	13.64	7.72	7.79
56MAR-00.0	Marshall Creek at mouth	6/24/2009	13:53:00	258	7.67	17.9	7.8	
56MAR-00.0	Marshall Creek at mouth	7/29/2009	9:00:00	261.2	7.38	16.82	5.46	5.68
56MAR-00.0	Marshall Creek at mouth	7/29/2009	13:15:00	262.5	7.44	18.65	5.83	
56MAR-05.3	Marshall Creek at McKenzie Rd.	9/17/2008	11:37:00	248	7.35	10.03	9.47	
56MAR-05.3	Marshall Creek at McKenzie Rd.	9/17/2008	16:50:00	248	7.68	16.08	12.29	
56MAR-05.3	Marshall Creek at McKenzie Rd.	6/24/2009	7:35:00	251	7.26	10.14	8.27	
56MAR-05.3	Marshall Creek at McKenzie Rd.	6/24/2009	7:35:00	251	7.27	10.19	8.38	
56MAR-05.3	Marshall Creek at McKenzie Rd.	6/24/2009	13:06:00	249	8.01	17.41	15.05	15
56MAR-05.3	Marshall Creek at McKenzie Rd.	7/29/2009	8:00:00	254.3	7.06	10.64	6.76	
56MAR-05.3	Marshall Creek at McKenzie Rd.	7/29/2009	12:38:00	249.8	7.52	15.73	11.97	
56NFR-03.8	North Fork Rock Creek at state line	10/29/2008	13:00:00	781	7.48	4.12	7.58	
56NFR-03.8	North Fork Rock Creek at state line	11/19/2008	15:15:00	412	7.27	4.14	7.04	7.5
56NFR-03.8	North Fork Rock Creek at state line	1/21/2009	15:42:00	254.2	7.26	0.18	10.61	10.5
56NFR-03.8	North Fork Rock Creek at state line	2/18/2009	15:10:00	290.4	7.69	0.95	11.21	
56NFR-03.8	North Fork Rock Creek at state line	2/24/2009	12:49:00	162.8	7.14	1.31	11.39	
56NFR-03.8	North Fork Rock Creek at state line	2/24/2009	16:33:00	150.9	7	1.79	11.19	
56NFR-03.8	North Fork Rock Creek at state line	3/4/2009	15:45:00	142	7.02	3.22	10.75	
56NFR-03.8	North Fork Rock Creek at state line	3/17/2009	14:45:00	165.7	7.23	2.17	11.65	
56NFR-03.8	North Fork Rock Creek at state line	4/1/2009	14:05:00	157	7.45	2.53	11.79	
56NFR-03.8	North Fork Rock Creek at state line	4/14/2009	14:00:00	118	7.28	6.11	11.24	
56NFR-03.8	North Fork Rock Creek at state line	5/6/2009	15:35:00	187.7	7.54	11.86	8.72	
56NFR-03.8	North Fork Rock Creek at state line	5/19/2009	12:55:00	223	6.93	14.8	6.55	
56NFR-03.8	North Fork Rock Creek at state line	5/19/2009	12:55:00	222	7.33	14.78	6.58	6.69
56NFR-03.8	North Fork Rock Creek at state line	6/3/2009	14:39:00	325	7.9	19.26	10.02	
56NFR-03.8	North Fork Rock Creek at state line	6/16/2009	12:35:00	392	7.58	20.41	7.13	7
56NFR-03.8	North Fork Rock Creek at state line	7/15/2009	15:15:00	654.6	7.59	18.64	7.33	
56NFR-03.8	North Fork Rock Creek at state line	8/19/2009	13:27:00	815.4	7.07	15.84	4.38	
56NFR-03.8	North Fork Rock Creek at state line	9/16/2009	13:23:00	372	7.09	14.49	4.49	
56NFR-03.8	North Fork Rock Creek at state line	9/16/2009	13:45:00	372	7.09	14.49	4.5	4.78
56RAT-00.1	Rattler Run at mouth	9/16/2008	13:08:00	385	8.23	7.51	10.61	
56RAT-00.1	Rattler Run at mouth	9/16/2008	16:21:00	386	8.22	8.32	10.41	
56RAT-00.1	Rattler Run at mouth	2/25/2009	8:59:00	243	7.32	0.74	12.39	
56RAT-00.1	Rattler Run at mouth	2/25/2009	14:40:00	246	7.43	1.5	12.04	12.05
56RAT-00.1	Rattler Run at mouth	6/22/2009	13:20:00	344	8.1	12.47	9.07	
56RAT-00.1	Rattler Run at mouth	6/22/2009	17:00:00	353	8.1	12.57	8.99	
56RAT-00.1	Rattler Run at mouth	7/28/2009	12:45:00	403.8	7.99	17.68	7.81	8.52
56RAT-00.1	Rattler Run at mouth	7/28/2009	17:06:00	402.8	8.02	19.38	7.47	
56RAT-05.7	Rattler Run at Fairfield above WWTP	6/22/2009	12:35:00	427	7.1	12.58	2.46	
56RAT-05.7	Rattler Run at Fairfield above WWTP	6/22/2009	16:25:00	429	7.1	13.14	2.68	
56RAT-05.7	Rattler Run at Fairfield above WWTP	7/27/2009	12:55:00	386	6.92	17.1	1.05	
56RAT-05.7	Rattler Run at Fairfield above WWTP	7/27/2009	16:50:00	353	6.96	18.6	1.67	
56ROC-00.5	Rock Creek at mouth	9/17/2008	9:36:00	312	7.67	12.72	5.49	
56ROC-00.5	Rock Creek at mouth	9/17/2008	14:58:00	308	7.85	13.28	8	
56ROC-00.5	Rock Creek at mouth	2/25/2009	13:30:00	183.7	7.73	1.81	12.52	
56ROC-00.5	Rock Creek at mouth	2/25/2009	17:05:00	186.5	7.78	1.78	12.44	
56ROC-00.5	Rock Creek at mouth	6/23/2009	9:35:00	301	8.42	14.6	10.25	
56ROC-00.5	Rock Creek at mouth	6/23/2009	15:20:00	295	8.86	20.13	12.67	
56ROC-00.5	Rock Creek at mouth	7/28/2009	10:50:00	307.4	8.26	24.1	9.03	
56ROC-00.5	Rock Creek at mouth	7/28/2009	15:52:00	298.2	8.64	28.06	11.6	
56ROC-08.9	Rock Creek at Jackson Rd.	9/17/2008	9:00:00	330	8.04	11.19	10.38	
56ROC-08.9	Rock Creek at Jackson Rd.	9/17/2008	14:32:00	322	8.42	14.74	11.6	
56ROC-08.9	Rock Creek at Jackson Rd.	6/23/2009	10:55:00	273.4	7.78	14.5	8.33	8.38
56ROC-08.9	Rock Creek at Jackson Rd.	6/23/2009	15:36:00	273.9	7.94	17.74	8.92	
56ROC-08.9	Rock Creek at Jackson Rd.	7/28/2009	10:53:00	332.1	8.21	22.83	9.51	
56ROC-08.9	Rock Creek at Jackson Rd.	7/28/2009	15:41:00	328.6	8.33	24.89	9.9	

Location ID	Location Name	Date	Time	Cond uS/cm	pH	Temp deg C	Hydrolab DO mg/L	Winkler DO mg/L
56ROC-12.5	Rock Creek below WWTP	7/28/2009	9:45:00	350.1	7.44	21.88	4.49	
56ROC-12.5	Rock Creek below WWTP	7/28/2009	14:50:00	348	7.77	24.36	8.38	
56ROC-13.7	Rock Creek at Rockford	9/17/2008	7:55:00	288	7.67	10.08	7.43	7.4
56ROC-13.7	Rock Creek at Rockford	9/17/2008	13:50:00	291	7.67	12.74	7.6	
56ROC-13.7	Rock Creek at Rockford	6/23/2009	9:25:00	300.8	7.82	13.43	8.21	
56ROC-13.7	Rock Creek at Rockford	6/23/2009	14:15:00	295	8.41	19.63	10.17	9.67
56ROC-13.7	Rock Creek at Rockford	7/28/2009	8:56:00	316.6	7.49	20.77	4.24	
56ROC-13.7	Rock Creek at Rockford	7/28/2009	14:11:00	316.4	7.55	23.99	5.12	
56ROC-15.4	Rock Creek below North Fork confluence	6/23/2009	8:25:00	290.4	7.82	11.39	8.32	8.28
56ROC-15.4	Rock Creek below North Fork confluence	6/23/2009	13:55:00	281.5	8.7	19.37	12.72	
56ROC-15.4	Rock Creek below North Fork confluence	7/28/2009	8:16:00	283.1	7.75	21.43	4.51	4.48
56ROC-15.4	Rock Creek below North Fork confluence	7/28/2009	13:43:00	282.4	8.23	24.67	8.07	
56ROC-25.9	Rock Creek at Idaho Rd.	10/29/2008	12:10:00	187	7.64	3.08	11	10.9
56ROC-25.9	Rock Creek at Idaho Rd.	11/19/2008	12:07:00	211	7.71	4.17	11.03	11.3
56ROC-25.9	Rock Creek at Idaho Rd.	1/21/2009	12:43:00	129.9	7.24	0.53	11.5	11.7
56ROC-25.9	Rock Creek at Idaho Rd.	2/18/2009	12:48:00	141	7.76	2.3	12.36	12.18
56ROC-25.9	Rock Creek at Idaho Rd.	2/24/2009	10:15:00	110.4	7.01	1.58	11.84	11.92
56ROC-25.9	Rock Creek at Idaho Rd.	2/24/2009	15:15:00	101.8	7.2	4.19	11.05	11.07
56ROC-25.9	Rock Creek at Idaho Rd.	2/24/2009	15:30:00	101.4	7.1	4.21	11.01	
56ROC-25.9	Rock Creek at Idaho Rd.	3/4/2009	13:15:00	110.4	7.1	7.61	10.07	
56ROC-25.9	Rock Creek at Idaho Rd.	3/17/2009	12:05:00	118.6	7.17	3.44	11.57	11.6
56ROC-25.9	Rock Creek at Idaho Rd.	4/1/2009	11:40:00	106.3	7.46	1.46	12.69	
56ROC-25.9	Rock Creek at Idaho Rd.	4/14/2009	11:28:00	85.2	7.45	6.52	12.03	11.6
56ROC-25.9	Rock Creek at Idaho Rd.	5/6/2009	13:25:00	102	8.98	10.04	12.98	12.92
56ROC-25.9	Rock Creek at Idaho Rd.	5/19/2009	10:50:00	133.6	8.54	13.31	12.15	12.15
56ROC-25.9	Rock Creek at Idaho Rd.	6/3/2009	13:32:00	158	8.68	23.85	13.53	12.9
56ROC-25.9	Rock Creek at Idaho Rd.	6/16/2009	11:00:00	211.4	7.34	19.36	5.81	5.8
56ROC-25.9	Rock Creek at Idaho Rd.	7/15/2009	13:38:00	135.4	7.05	21.8	3.81	
56ROC-25.9	Rock Creek at Idaho Rd.	8/19/2009	12:12:00	208.5	7.04	18.86	4.61	4.2
56ROC-25.9	Rock Creek at Idaho Rd.	9/16/2009	12:20:00	220.5	7.3	19.04	6.56	
56ROCWTP	Rockford WWTP	2/18/2009	13:55:00	585	8	0.67	14.3	13.7
56ROCWTP	Rockford WWTP	2/25/2009	8:30:00	543	7.95	0.93	14.94	
56ROCWTP	Rockford WWTP	2/25/2009	15:30:00	544	8.04	1.05	15.66	
56ROCWTP	Rockford WWTP	3/18/2009	13:45:00	450	8.8	3.37	18.04	
56ROCWTP	Rockford WWTP	4/15/2009	16:06:00	383.5	8.71	9.93	12.39	
56ROCWTPDR	Rockford WWTP groundwater drain	6/23/2009	11:19:00	437	6.93	16.14	4.84	
56ROCWTPDR	Rockford WWTP groundwater drain	7/28/2009	10:40:00	444	6.21	18.34		
56ROS-01.7	Rose Creek at state line	10/29/2008	12:30:00	223	7.47	3.18	9.8	
56ROS-01.7	Rose Creek at state line	11/19/2008	13:37:00	239	7.6	4.21	10.2	
56ROS-01.7	Rose Creek at state line	11/19/2008	14:24:00	239	7.61	4.24	10.25	
56ROS-01.7	Rose Creek at state line	1/21/2009	15:00:00	211.8	7.09	0.32	10.2	
56ROS-01.7	Rose Creek at state line	2/18/2009	14:33:00	204.2	7.97	2.16	13.08	
56ROS-01.7	Rose Creek at state line	2/24/2009	11:40:00	155.6	7.09	2.02	11.13	11
56ROS-01.7	Rose Creek at state line	2/24/2009	15:50:00	161.5	7.1	3.95	10.48	
56ROS-01.7	Rose Creek at state line	3/4/2009	14:35:00	167.4	7.13	6.51	9.7	11
56ROS-01.7	Rose Creek at state line	3/17/2009	13:55:00	175.7	7.33	3.25	11.32	
56ROS-01.7	Rose Creek at state line	4/1/2009	12:40:00	161.6	7.58	2.24	12.53	
56ROS-01.7	Rose Creek at state line	4/14/2009	12:40:00	153	7.78	7.16	12.64	
56ROS-01.7	Rose Creek at state line	5/6/2009	14:50:00	194	7.85	10.33	10.8	
56ROS-01.7	Rose Creek at state line	5/19/2009	12:02:00	115	7.76	13.33	10.59	
56ROS-01.7	Rose Creek at state line	6/3/2009	14:09:00	262	7.89	17.69	10.68	
56ROS-01.7	Rose Creek at state line	6/16/2009	11:45:00	287.6	7.36	16.08	6.21	
56ROS-01.7	Rose Creek at state line	7/15/2009	14:30:00	284.9	7.35	15.93	6.59	6.4
56ROS-01.7	Rose Creek at state line	8/19/2009	12:50:00	285.8	6.97	14.03	5.57	
56ROS-01.7	Rose Creek at state line	9/16/2009	12:50:00	275	7.31	13.47	6.7	6.51

Location ID	Location Name	Date	Time	Cond uS/cm	pH	Temp deg C	Hydrolab DO mg/L	Winkler DO mg/L
56SPA-00.0	Spangle Creek at mouth	6/23/2009	10:25:00	413	8.37	13.13	9.76	
56SPA-00.0	Spangle Creek at mouth	6/23/2009	16:20:00	416	8.4	17.31	8.62	
56SPA-05.2	Spangle Creek below WWTP	6/23/2009	7:50:00	499	7.51	9.99	5.66	5.63
56SPA-05.2	Spangle Creek below WWTP	6/23/2009	13:20:00	513	7.6	20.78	6.53	
56SPA-05.2	Spangle Creek below WWTP	7/28/2009	9:20:00	512.3	7.38	19.65	2.96	
56SPA-05.2	Spangle Creek below WWTP	7/28/2009	14:35:00	549.7	7.49	31.85	2.88	
56SPAWTP	Spangle WTP	2/18/2009	8:17:00	650	7.36	6.74	4.72	4.79
56SPAWTP	Spangle WTP	2/25/2009	12:59:00	529.3	7.12	7.31	3.21	3.21
56SPAWTP	Spangle WTP	3/18/2009	8:55:00	625	7.19	7.29	3.6	3.6
56SPAWTP	Spangle WTP	4/15/2009	8:36:00	645	7.15	9.34	4.53	4.52
56SPAWTP	Spangle WTP	5/20/2009	9:15:00	570	7.3	13.9	3.79	3.75
56SPAWTP	Spangle WTP	6/17/2009	9:15:00	656	7.11	19.27	3.38	3.5
56SPAWTP	Spangle WTP	6/23/2009	13:24:00	667	7.26	16.75	7.11	
56SPAWTP	Spangle WTP	7/15/2009	9:15:00	648.1	7.11	19.33	3.81	3.9
56SPAWTP	Spangle WTP	7/28/2009	14:30:00	638	7.12	20.87		
56SPAWTP	Spangle WTP	8/19/2009	8:30:00	601.7	6.78	19.74	2.97	3.12
56SPAWTP	Spangle WTP	9/16/2009	8:55:00	632	6.84	19.33	3.56	3.43
56STE-00.0	Stevens Creek at mouth	6/24/2009	7:50:00	443.8	8.06	13.6	8.61	
56STE-00.0	Stevens Creek at mouth	6/24/2009	13:31:00	444.6	8.08	16.88	7.93	
56STE-00.0	Stevens Creek at mouth	7/29/2009	7:56:00	441	7.15	11.43	6.32	
56STE-00.0	Stevens Creek at mouth	7/29/2009	13:05:00	441	7.33	14.26	6.52	
56TEKWTP	Tekoa WTP	2/18/2009	10:25:00	390	7.35	9.03	6.07	6.26
56TEKWTP	Tekoa WTP	2/24/2009	9:00:00	331.7	7.33	7.23	5.48	5.48
56TEKWTP	Tekoa WTP	2/24/2009	13:57:00	356	7.24	7.44	4.65	
56TEKWTP	Tekoa WTP	3/18/2009	10:05:00	410	7.29	7.06	7.8	7.79
56TEKWTP	Tekoa WTP	4/15/2009	10:43:00	391	7.27	8.43	7.85	
56TEKWTP	Tekoa WTP	5/20/2009	11:15:00	412	7.14	11.81	5.73	5.7
56TEKWTP	Tekoa WTP	5/20/2009	11:15:00	412	7.15	11.82	5.73	
56TEKWTP	Tekoa WTP	6/17/2009	10:10:00	394.4	7.11	14.78	6.46	
56TEKWTP	Tekoa WTP	6/23/2009	9:50:00	390	7.27	14.38	6.15	
56TEKWTP	Tekoa WTP	7/15/2009	11:30:00	423.8	7.14	16.31	5.86	
56TEKWTP	Tekoa WTP	7/28/2009	9:12:00	464	7.12	17.69		
56TEKWTP	Tekoa WTP	8/19/2009	11:20:00	483.6	7.13	17.91	4.7	
56TEKWTP	Tekoa WTP	9/16/2009	10:06:00	592	6.96	17.9	4.99	
56Unk(LIT-08.6)	Unknown drainage at Agency Rd.	1/21/2009	11:33:00	138.6	7.08	0.24	11.41	
56Unk(LIT-08.6)	Unknown drainage at Agency Rd.	2/18/2009	11:55:00	140	7.31	1.45	11.14	
56Unk(LIT-08.6)	Unknown drainage at Agency Rd.	2/24/2009	13:13:00	123.3	6.56	0.93	11.34	11.3
56Unk(LIT-08.6)	Unknown drainage at Agency Rd.	2/24/2009	16:00:00	118.4	6.53	0.33	11.49	11.19
56Unk(LIT-08.6)	Unknown drainage at Agency Rd.	3/4/2009	11:55:00	107.2	6.89	4.82	10.15	
56Unk(LIT-08.6)	Unknown drainage at Agency Rd.	3/18/2009	12:10:00	135.2	7.02	2.68	11.25	
56Unk(LIT-08.6)	Unknown drainage at Agency Rd.	4/1/2009	10:00:00	105.8	7.1	1.8	11.49	11.41
56Unk(LIT-08.6)	Unknown drainage at Agency Rd.	4/15/2009	14:36:00	81.3	7.13	9.31	9.29	9.29
56Unk(LIT-08.6)	Unknown drainage at Agency Rd.	5/6/2009	12:12:00	138	7.23	7.81	9.21	9.01
56Unk(LIT-08.6)	Unknown drainage at Agency Rd.	5/20/2009	12:45:00	140	7.28	10.32	8.89	
								Initial Depth To water
56-HHWTP-MW1	Hangman Hills WWTP Well 1	6/23/2009	09:54	596	6.94	10.65	5.99	14.37
56-HHWTP-MW1	Hangman Hills WWTP Well 1	7/28/2009	09:27	557	7.36	11.11	11.26	15.07
56-HHWTP-MW2	Hangman Hills WWTP Well 2	6/23/2009	10:30	1144	6.82	10.32	0.67	11.15
56-HHWTP-MW2	Hangman Hills WWTP Well 2	7/28/2009	10:15	1104	6.73	10.50	4.05	14.50
56-HHWTP-MW3	Hangman Hills WWTP Well 3	6/23/2009	11:01	1223	7.15	9.33	7.06	17.45
56-HHWTP-MW3	Hangman Hills WWTP Well 3	7/28/2009	10:49	1181	7.03	9.97	12.54	17.90

GC: Golf Course
LS: Little Spokane
WWTP: Wastewater Treatment Plant

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Appendix D. Laboratory Data

Abbreviations used in Appendix D

Alk	Alkalinity, Total as $CaCO_3$	mg/L
NH3	Ammonia Nitrogen	mg/L
Cl	Chloride	mg/L
DOC	Dissolved Organic Carbon	mg/L
NO2/NO3	Nitrate and Nitrite Nitrogen	mg/L
OP	Orthophosphate	mg/L
TOC	Total Organic Carbon	mg/L
TPN	Total Persulfate Nitrogen	mg/L
TP	Total Phosphorus	mg/L
TSS	Total Suspended Solids	mg/L
BOD	Biochemical oxygen Demand	mg/L
Chloro	Chlorophyll	ug/L
VOM	Volatile Organic Matter	mg/L

Table D-1. Laboratory data.

Location ID	Date	Time	Alk		NH3		Cl		DOC		NO2/NO3		OP		TOC		TPN		TP		TSS		BOD		Chloro		VOM
34PHI-01.6	3/4/2009	8:16:00	51		0.067		3.68		14.3		0.471		0.0180		5.5		1.49		0.4060		77						
34PHI-01.6	3/18/2009	8:00:00	102		0.043		4.55		17.3		0.064		0.0103		15.4		1.17		0.0913		2						
34PHI-01.6	3/31/2009	13:19:00	96.4		0.010	U	5.02		17.7		0.017		0.0069		18.3		0.99		0.0546		1						
34PHI-01.6	4/15/2009	9:20:00	114		0.025		6.58		18.5		0.010	U	0.0194		18.6		1.00		0.0262		1						
34PHI-01.6	5/5/2009	14:47:00	142		0.010	U	8.11		19.9		0.010	U	0.0107		18.3		1.08		0.0296		1	U					
34PHI-01.6	5/20/2009	9:58:00	156		0.012		8.04		20.6		0.010	U	0.0147		19.3		1.11		0.0396		2	U					
34PHI-01.6	6/3/2009	14:10:00	172		0.014		7.4		23.6		0.010	U	0.0250		20.5		1.34		0.0437		2	U					
55BEA-03.7	10/28/2008	14:20:00	150		0.010	U	3.15		1.6	J	0.584		0.0037		1.8	J	1.47		0.0078		2						
55BEA-03.7	11/18/2008	13:30:00	150		0.010	U	3.85		3.2		1.300		0.0065		3.6		1.55		0.0072	J	2						
55BEA-03.7	1/20/2009	15:35:00	168		0.032		4.45		7.6		1.290		0.0089		8.6		1.08		0.0253		2						
55GRI-00.5	2/9/2009	13:25:00	163		0.010	UJ	9.66		1	U	1.980		0.0071		1	U	1.98		0.0074		1	U	4	J			
55GRI-00.5	2/9/2009	13:25:00	163		0.010	UJ	9.74		1	U	1.990		0.0079		1	U	3.39		0.0068		1	U	4	J			
55GRI-00.5	2/23/2009	13:10:00			0.010	U					2.280		0.0068				2.27		0.0073								
55GRI-00.5	2/25/2009	11:44:00	152		0.010	U	8.13		1	U	2.180		0.0075		1	U	2.81		0.0057		1	U					
55GRI-00.5	2/25/2009	11:44:00	152		0.010	U	8.13		1	U	2.180		0.0075		1	U	2.81		0.0057		1	U					
55GRI-00.5	3/11/2009	12:44:00	152		0.010	U	7.19		1	U	1.790		0.0076		1	U	1.76		0.0082		1	U	2	U			
55GRI-00.5	3/24/2009	9:57:00	143		0.010	U	7.19		1	U	2.110		0.0067		1	U	1.91		0.0070		1	U					
55GRI-00.5	4/6/2009	12:50:00	148		0.010	U	7.74		1	U	2.230		0.0072		1	U	1.81		0.0069		1	U	2	U			
55GRI-00.5	4/6/2009	12:50:00	146		0.010	U	7.47		1	U	2.340		0.0073		1	U	2.62		0.0078		1	U	2	U			
55GRI-00.5	4/20/2009	12:20:00	146		0.010	U	7.75		1	U	2.520		0.0115		1	U	2.44		0.0090		1	U					
55GRI-00.5	5/4/2009	13:20:00	148		0.010	U	7.74		1	U	1.300		0.0074		1	U	2.35		0.0060		1	U	2	U			
55GRI-00.5	5/18/2009	13:05:00	147		0.010	U	7.61		1	U	2.050		0.0085		1	U	2.17		0.0070		1	U					
55GRI-00.5	6/1/2009	13:00:00	147		0.010	U	7.58		1	U	2.270		0.0075		1	U	1.90		0.0080		1	U	2	U			
55GRI-00.5	6/15/2009	13:10:00	146		0.010	U	6.48		1	U	1.750		0.0082		1	U	1.77		0.0082		1	U					
55GRI-00.5	6/15/2009	13:10:00	147		0.010	U	6.51		1	U	2.190		0.0084		1	U	1.84		0.0076		1	U					
55GRI-00.5	7/6/2009	13:17:00	152		0.010	U	8.87		1	U	1.820		0.0090		1	U	1.74		0.0086		1	U	2	U			
55GRI-00.5	7/13/2009	12:40:00	146		0.010	U	7.92		1	U	1.850		0.0099		1	U	2.42		0.0067		1	U					
55GRI-00.5	8/3/2009	13:42:00	152		0.010	U	8.72		1	U	1.980		0.0068		1	U	1.77		0.0074		1	U	4	U			
55GRI-00.5	8/17/2009	10:53:00	155		0.010	U	9.01		1	U	1.880		0.0076		1	U	1.81		0.0072		1	U					
55GRI-00.5	9/8/2009	11:40:00	153		0.010	U	9.03		1	U	1.840		0.0073		1	U	1.91		0.0095		1	U	2	UJ			
55GRI-00.5	9/22/2009	11:25:00	154		0.010	U	9.23		1	U	1.710		0.0070		1	U	1.76		0.0080		1	U					
55GRI-00.5	9/22/2009	11:25:00	156		0.010	U	9.38		1	U	1.840		0.0074		1	U	1.83		0.0069		1	U					
56A070	9/17/2008	11:01:00	178		0.010	U	14.2		1.9		0.776		0.0080		2.1		0.97		0.0310								
56A070	9/17/2008	17:40:00	172		0.010	U	14.3		1.9		0.698		0.0084		2.4		0.87		0.0270								
56A070	2/25/2009	13:15:00	31.7		0.115		4.32		6.3		5.880		0.1130		5.6		6.23		0.4910		236		6	U			
56A070	2/25/2009	16:40:00	28.9		0.125		4.15		6		5.910		0.1100		5.7		7.14		0.5580		317						
56A070	6/22/2009	15:25:00																							2360		300
56A070	6/24/2009	12:15:00	140		0.010	U	9.52		3.1		0.753		0.0181		3.8		1.04		0.0628		8						
56A070	6/24/2009	17:05:00	140		0.010	U	9.61		3.3		0.846		0.0218		4.2		1.17		0.0696		8						
56A070	7/27/2009	15:30:00																							3090		370

Location ID	Date	Time	Alk		NH3		Cl		DOC		NO2/NO3		OP		TOC		TPN		TP		TSS		BOD		Chloro		VOM
56A070	7/29/2009	12:04:00	169		0.010	U	14.3		2.7		0.716		0.0313		3		0.99		0.0471								
56A070	7/29/2009	16:55:00	164		0.010	U	14.3		2.7		0.652		0.0334		3.4		0.91		0.0443								
56A200	9/16/2008	13:21:00	116		0.010	U	7.48		4.4		0.010	U	0.0055		4.8		0.41		0.0410								
56A200	9/16/2008	16:30:00	116		0.010	U	8.04		4.6		0.010	U	0.0055		4.7		0.42		0.0591								
56A200	9/16/2008	16:30:00	116		0.010	U	7.99		4.4		0.010	U	0.0048		4.7		0.42		0.0747								
56A200	2/24/2009	12:20:00	40		0.032		3.49		5.2		4.070		0.0897		5.7		4.44		0.3650		132		4	U			
56A200	2/24/2009	16:15:00	35.1		0.068		3.31		5.6		4.370		0.0979		7		4.70		0.4200		250						
56A200	6/22/2009	13:45:00																							1490		340
56A200	6/23/2009	11:55:00	83.3		0.010	U	4.17		3.9		1.280		0.0386		4.1		1.54		0.0923								
56A200	6/23/2009	16:30:00	85.5		0.010	U	4.6		3.8		1.280		0.0416		4.2		1.58		0.0918								
56A200	7/27/2009	10:40:00																							1520		340
56A200	7/28/2009	12:10:00	115		0.010	U	6.44		4.7		0.076		0.0257		4.6		0.48		0.0676								
56A200	7/28/2009	16:25:00	114		0.010	U	6.52		4.2		0.088		0.0270		4.8		0.48		0.0704								
56BLA-00.0	11/19/2008	16:45:00	5	U	0.010	U	0.1	U	1	U	0.010	U	0.0030	U	1	U	0.03	U	0.0050	U	1	U					
56BLA-00.0	12/17/2008	15:57:00			0.010	U			1	U	0.010	U	0.0030	U	1	U	0.03	U	0.0050	U	53						
56BLA-00.0	1/21/2009	0:00:00							1	U			0.0030	U													
56BLA-00.0	2/18/2009	17:10:00							1	U			0.0030	U													
56BLA-00.0	3/4/2009	18:10:00	5	U	0.010	U	0.5	U	1	U	0.010	U	0.0030	U	1	U	0.03	U	0.0050	U	1	U					
56BLA-00.0	3/18/2009	15:40:00	5	U	0.010	U	0.1	U	1	U	0.010	U	0.0030	U	1	U	0.03	U	0.0050	U	1	U					
56BLA-00.0	4/1/2009	17:00:00	5	U	0.010	U	0.2	U	1	U	0.010	U	0.0030	U	1	U	0.03	U	0.0050	U	1	U					
56BLA-00.0	4/15/2009	17:43:00	5	U	0.010	U	0.1	U	1	U	0.010	U	0.0030	U	1	U	0.03	U	0.0050	U	1	U					
56BLA-00.0	5/6/2009	18:20:00	5	U	0.010	U	0.1	U	1	U	0.010	U	0.0030	U	1	U	0.03	U	0.0050	U	1	U					
56BLA-00.0	5/20/2009	15:50:00							1	U			0.0030	U													
56BLA-00.0	6/3/2009	16:55:00							1	U			0.0030	U													
56BLA-00.0	6/17/2009	14:20:00	5	U	0.010	U	0.1	U	1	U	0.010	U	0.0030	U	1	U	0.03	U	0.0050	U	1	U					
56BLA-00.0	6/24/2009	17:37:00	5	U	0.010	U	0.1	U	1	U	0.010	U	0.0030	U	1	U	0.03	U	0.0050	U	1	U					
56BLA-00.0	7/15/2009	17:55:00	5	U	0.010	U	0.1	U	1	U	0.010	U	0.0030	U	1	U	0.03	U	0.0050	U	1	U					
56BLA-00.0	7/29/2009	0:00:00	5	U	0.010	U	0.1	U	1	U	0.010	U	0.0030	U	1	U	0.03	U	0.0050	U							
56BLA-00.0	8/19/2009	15:30:00							1	U			0.0030	U													
56BLA-00.0	9/16/2009	15:25:00							1	U			0.0030	U													
56CAL-00.1	2/25/2009	10:10:00	50.6		0.022		6.75		6.7		2.200		0.1360		6.3		2.55		0.2340		17	U					
56CAL-00.1	2/25/2009	10:10:00	50.4		0.046		6.82		6		2.200		0.1320		6.2		2.72		0.2350		19						
56CAL-00.1	2/25/2009	15:30:00	49.7		0.016		6.31		6.1		2.460		0.1280		5.9		2.47		0.2390		21						
56CAL-00.1	6/23/2009	11:55:00	109		0.010	U	4.53		2.3		2.950		0.0675		2.7		3.45		0.0887								
56CAL-00.1	6/23/2009	17:20:00	109		0.010	U	4.55		2.5		3.080		0.0714		2.7		3.14		0.0831								
56CAL-00.1	7/28/2009	12:47:00	125		0.010	U	5.58		2.3		2.960		0.0911		2.4		3.16		0.0990								
56CAL-00.1	7/28/2009	12:47:00	126		0.010	U	5.54		2.4		2.930		0.0874		2.4		3.23		0.0938								
56CAL-00.1	7/28/2009	17:00:00	126		0.010	U	5.47		2.8		2.760		0.0942		2.5		2.79		0.0967								
56CAL-12.2	10/29/2008	13:55:00	22		0.010	U	1.1		2.3	J	0.010	U	0.0160		2.4	J	0.07		0.0230		1						
56CAL-12.2	11/19/2008	16:14:00	18		0.010	U	1.51		3.9		0.010	U	0.0150		3.9		0.12		0.0220		14						
56CAL-12.2	12/17/2008	15:49:00	29.5	J	0.010	U	1.57		3		0.015		0.0239		3.3		0.09		0.0344		1						
56CAL-12.2	1/20/2009	12:00:00	14.2		0.010	U	1		2.9		0.010	U	0.0133	J	3.2		0.08		0.0208		1	U					

Location ID	Date	Time	Alk		NH3		Cl		DOC		NO2/NO3		OP		TOC		TPN		TP		TSS		BOD		Chloro		VOM
56CAL-12.2	2/17/2009	12:50:00	14.8		0.010	U	1		2.6		0.010	U	0.0124		2.6		0.06		0.0176		1	U					
56CAL-12.2	2/25/2009	8:55:00	13.7		0.020		0.9		5.1		0.018		0.0168		5.2		0.15		0.0435		3	U					
56CAL-12.2	2/25/2009	14:30:00	12.8		0.010	U	0.88		5.3		0.017		0.0204		5.6		0.15		0.0484		7						
56CAL-12.2	3/4/2009	16:35:00	11.5		0.010	U	0.82		7.3		0.019		0.0257		7.7		0.17		0.0825		8						
56CAL-12.2	3/4/2009	16:35:00	11.8		0.010	U	0.84		7.3		0.019		0.0254		7.7		0.17		0.0819		8						
56CAL-12.2	3/17/2009	15:53:00	12.7		0.010	U	0.92		1	U	0.010	U	0.0202		5.8		0.13		0.0608		2						
56CAL-12.2	4/1/2009	15:38:00	11.7		0.010	U	0.79		5.4		0.010	U	0.0205		5.5		0.12		0.0711		4						
56CAL-12.2	4/14/2009	15:24:00	9.9		0.010	U	0.84		4.5		0.029		0.0192		5.1		0.13		0.0655		34						
56CAL-12.2	5/6/2009	17:04:00	9.6		0.010	U	0.74		2.9		0.015		0.0162		2.9		0.06		0.0543		26						
56CAL-12.2	5/20/2009	14:38:00	11		0.010	U	0.72		2.6		0.010	U	0.0157		2.4		0.04		0.0309		5						
56CAL-12.2	6/3/2009	15:34:00	13.3		0.010	U	0.83		2.5		0.010	U	0.0239		2.8		0.09		0.0300		5						
56CAL-12.2	6/3/2009	15:34:00	13		0.010	U	0.8		2.6		0.010	U	0.0232		2.7		0.07		0.0295		3						
56CAL-12.2	6/17/2009	13:05:00	15.5		0.010	U	0.69		3		0.010	U	0.0179		3.4		0.07		0.0268		1						
56CAL-12.2	7/15/2009	16:15:00	21.6		0.010	U	0.89		2.8		0.011		0.0351		3		0.08		0.0277		1						
56CAL-12.2	8/19/2009	14:20:00	35.5		0.010		0.87		2.8		0.050		0.0366		2.8		0.14		0.0462		5						
56COV-00.2	9/16/2008	11:20:00	128		0.010	U	3.31		1.2		3.960		0.0865		1.3		4.18		0.1000								
56COV-00.2	9/16/2008	15:37:00	127		0.010	U	3.33		1.2		2.800		0.0874		1.3		4.16		0.1020								
56COV-00.2	6/22/2009	9:40:00	127		0.014		3.34		3.4		3.870		0.0857		3.7		4.30		0.1440								
56COV-00.2	6/22/2009	14:30:00	126		0.014		3.92		3.7		3.820		0.0920		3.9		4.21		0.1390								
56COV-00.2	7/27/2009	10:10:00	135		0.018		4.38		2.3		4.370		0.1030		2.5		4.57		0.1250								
56COV-00.2	7/27/2009	14:50:00	132		0.015		3.96		2.2		4.320		0.1140		2.2		4.56		0.1210								
56FAIWWTP	12/17/2008	11:36:00	160	J	1.300		64.6		8.7		8.250		1.8000		10.5		10.20		1.9400		44						
56FAIWWTP	1/21/2009	0:00:00	142		6.340		49		6		3.780		1.5900		7.3		9.52		1.8700		10						
56FAIWWTP	2/18/2009	13:35:00	163		7.560		59.4		6.8		2.770		1.5400		8.5		11.00		2.0200		6						
56FAIWWTP	2/24/2009	13:20:00	140		6.730		41.2		6.7		2.800		1.2900		9.3		9.28		1.5100		11	U					
56FAIWWTP	3/18/2009	13:20:00	126		2.970		40		5.7		4.870		0.6960		12.3		8.17		1.1300		14						
56FAIWWTP	4/15/2009	15:40:00	115		0.028		42		9.4		2.480		0.3100		14.4		3.64		1.1700		70						
56FAIWWTP	5/20/2009	13:54:00	148		0.376		43.5		10.4		1.480		0.9520		10.5		3.19		1.2800		3						
56FREWTP	12/17/2008	15:03:00	202	J	0.016		81.3		11.8		0.010	U	1.1100		14		1.21		1.2100		3						
56FREWTP	2/18/2009	16:00:00	208		1.060		63.7		8.9		0.568		1.1100		10.8		2.77		0.1320		4						
56FREWTP	2/18/2009	16:00:00	208		1.100		63.6		8.8		0.568		1.1700		10.8		2.85		1.2100		4						
56FREWTP	3/18/2009	14:23:00	171		0.776		47.1		6.8		1.340		0.1310		10.4		3.45		1.2800		16						
56FREWTP	3/18/2009	14:23:00	172		0.805		47.1		6.6		1.370		1.0900		10.7		3.61		1.3200		16						
56FREWTP	4/15/2009	16:35:00	194		1.080		53		9.6		0.010		3.9400		13.8		2.74		5.0700		19						
56HAN-01.9	9/17/2008	11:15:00	177		0.010	U	11.7		1.8		0.749		0.0098		2.1		0.94		0.0320								
56HAN-01.9	9/17/2008	17:25:00	173		0.010	U	11.5		1.9		0.725		0.0110		2.3		0.95		0.0280								
56HAN-01.9	6/24/2009	7:35:00	99		0.010	U	9.36		1.4		1.680		0.0557		1.4		1.82		0.0737		8						
56HAN-01.9	6/24/2009	11:23:00	140		0.010	U	7.97		3.2		0.814		0.0195		3.6		1.10		0.0628		6						
56HAN-01.9	6/24/2009	16:23:00	138		0.010	U	8.13		3.5		0.936		0.0240		3.8		1.26		0.0695		7						
56HAN-01.9	7/29/2009	11:14:00	169		0.010	U	12		2.7		0.712		0.0364		3.1		1.00		0.0496								
56HAN-01.9	7/29/2009	15:30:00	166		0.016		12.1		2.7		0.732		0.0376		3.2		0.99		0.0480								
56HAN-01.9	7/29/2009	15:30:00	165		0.012		11.9		2.7		0.715		0.0374		3.1		0.99		0.0520								

Location ID	Date	Time	Alk		NH3		Cl		DOC		NO2/NO3		OP		TOC		TPN		TP		TSS		BOD		Chloro		VOM
56HAN-03.6	6/24/2009	10:34:00	134		0.010	U	6.97		3.7		0.820		0.0219		4.2		1.12		0.0753		8						
56HAN-03.6	6/24/2009	15:40:00	129		0.011		7.05		3.8		0.992		0.0328		4.7		1.32		0.0927		10						
56HAN-03.6	7/29/2009	10:33:00	162		0.015		10.7		2.9		0.489		0.0373		3.3		0.79		0.0582								
56HAN-03.6	7/29/2009	14:45:00	161		0.011		10.8		2.8		0.487		0.0357		3.2		0.77		0.0542								
56HAN-04.6	6/24/2009	9:24:00	132		0.010	U	6.3				0.887		0.0267		4.4		1.24		0.0866		9						
56HAN-04.6	6/24/2009	14:28:00	127		0.021		6.37		4.3		1.080		0.0432		5.1		1.44		0.1260		12						
56HAN-04.6	7/29/2009	9:35:00	172		0.010	U	9.83		3		0.277		0.0296		3.7		0.57		0.0516								
56HAN-04.6	7/29/2009	13:48:00	171		0.010	U	9.82		3.2		0.237		0.0273		4		0.53		0.0492								
56HAN-06.2	2/25/2009	9:50:00	31.8		0.122		4.36		5.9		5.920		0.1150		5.6		6.47		0.4490		314		6	U			
56HAN-06.2	2/25/2009	9:50:00	31.4		0.126		4.39		5.9		6.020		0.1120		5.7		6.59		0.4670		440		6	U			
56HAN-06.2	2/25/2009	17:35:00	28.1		0.126		4.05		6.3		5.950		0.1070		5.7		7.05		0.4540		217						
56HAN-06.2	6/24/2009	12:24:00	120		0.055		5.9		4.9		1.330		0.0739		5.8		1.73		0.1670		22						
56HAN-06.2	6/24/2009	17:10:00	118		0.079		5.82		5		1.610		0.0798		4.9		2.47		0.1950		26						
56HAN-06.2	7/29/2009	12:15:00	161		0.010	U	8.78		3.2		0.113		0.0327		3.9		0.42		0.0592								
56HAN-06.2	7/29/2009	16:26:00	161		0.010	U	8.82		3.3		0.102		0.0299		3.8		0.43		0.0542								
56HAN-07.8	9/17/2008	0:00:00	166		0.010	U	7.95		2.4		0.118		0.0067		2.6		0.34		0.0250								
56HAN-07.8	9/17/2008	16:31:00	165		0.010	U	8.16		2.4		0.105		0.0052		2.8		0.32		0.0200								
56HAN-08.9	6/24/2009	11:02:00	109		0.120		5.18		5.2		2.000		0.1010		7.2		2.41		0.2320		17						
56HAN-08.9	6/24/2009	11:02:00	108		0.120		5.13		5.4		1.640		0.0993		5.2		2.15		0.2220		22						
56HAN-08.9	6/24/2009	16:14:00	109		0.120		5.08		5.2		1.980		0.1040		6.9		2.59		0.2400		24						
56HAN-08.9	7/29/2009	11:20:00	157		0.010	U	7.82		3.6		0.010	U	0.0455		4.3		0.33		0.0699								
56HAN-08.9	7/29/2009	15:37:00	156		0.010	U	7.7		3.6		0.010	U	0.0437		4.5		0.33		0.0682								
56HAN-12.6	6/24/2009	10:00:00	116		0.086		5		4.3		2.070		0.0940		5.2		2.67		0.1760		26						
56HAN-12.6	6/24/2009	15:20:00	119		0.057		5.36		4.2		2.140		0.0833		4.7		2.92		0.1590		21						
56HAN-12.6	7/29/2009	10:30:00	155		0.017		7.2		3.7		0.071		0.0533		3.9		0.41		0.0937								
56HAN-12.6	7/29/2009	14:51:00	154		0.010	U	6.91		3.6		0.043		0.0436		4.1		0.36		0.0862								
56HAN-13.2	6/24/2009	9:03:00	117		0.064		4.85		4.3		2.210		0.0893		5		3.03		0.1620		21						
56HAN-13.2	6/24/2009	14:40:00	118		0.046		5.03		4.2		2.280		0.0850		5.1		2.96		0.1660		20						
56HAN-13.2	7/29/2009	9:26:00	151		0.010	U	5.63		3.5		0.063		0.0446		3.8		0.37		0.0900								
56HAN-13.2	7/29/2009	14:03:00	153		0.010	U	5.72		3.4		0.020		0.0373		3.9		0.34		0.0882								
56HAN-14.5	6/24/2009	8:15:00	113		0.046		4.98		4.3		2.240		0.0822		4.8		3.43		0.1600		22						
56HAN-14.5	6/24/2009	13:51:00	114		0.027		4.94		4.2		2.330		0.0805		4.4		3.02		0.1560		18						
56HAN-14.5	7/29/2009	8:25:00	143		0.010	U	5.3		3.4		0.057		0.0518		3.9		0.36		0.0864								
56HAN-14.5	7/29/2009	8:25:00	143		0.010	U	5.33		3.4		0.082		0.0515		3.7		0.39		0.0907								
56HAN-14.5	7/29/2009	13:23:00	144		0.010	U	5.28		3.7		0.010	U	0.0520		4.1		0.28		0.0840								
56HAN-18.8	2/25/2009	11:40:00	26.1		0.129		3.97		6		5.960		0.1120		5.6		5.78		0.4900		225		6	U			
56HAN-18.8	2/25/2009	16:30:00	27.4		0.128		4.06		6.9		6.560		0.1060		6.4		6.58		0.3870		156						
56HAN-19.1	9/17/2008	13:13:00	138		0.010	U	4.6		2.6		0.010	U	0.0170		3		0.24		0.0330								
56HAN-19.1	9/17/2008	16:05:00	137		0.010	U	4.65		2.7		0.010	U	0.0180		3.1		0.25		0.0340								
56HAN-19.1	6/22/2009	14:35:00																							891		240
56HAN-19.1	6/23/2009	11:10:00	108		0.035		4.54		4.3		2.300		0.0770		6.2		2.83		0.1620								

Location ID	Date	Time	Alk		NH3		Cl		DOC		NO2/NO3		OP		TOC		TPN		TP		TSS		BOD		Chloro		VOM
56HAN-19.1	6/23/2009	16:55:00	109		0.018		4.38		4.2		2.280		0.0739		4.4		2.71		0.1490								
56HAN-19.1	7/27/2009	14:42:00																							434		165
56HAN-19.1	7/28/2009	16:27:00	134		0.010	U	4.7		3.9		0.010	U	0.0565		4.2		0.32		0.0958								
56HAN-21.8	9/17/2008	9:51:00	135		0.010	U	4.63		2.4		0.010	U	0.0260		2.6		0.22		0.0430								
56HAN-21.8	9/17/2008	9:55:00	135		0.010	U	4.54		2.5		0.010	U	0.0260		2.7		0.22		0.0430								
56HAN-21.8	9/17/2008	15:17:00	133		0.010	U	4.54		2.4		0.010	U	0.0300		2.7		0.23		0.0440								
56HAN-21.8	6/23/2009	8:40:00	93.1		0.011		3.82		3.8		1.970		0.0647		4.6		2.25		0.1420								
56HAN-21.8	6/23/2009	14:05:00	93.3		0.011		3.96		3.8		1.970		0.0609		4.6		2.48		0.1470								
56HAN-21.8	6/23/2009	14:05:00	93.2		0.010		3.87		3.8		1.650		0.0636		4		1.96		0.1370								
56HAN-21.8	7/28/2009	10:10:00	129		0.010		5.08		3.8		0.026		0.0647		4		0.38		0.1110								
56HAN-21.8	7/28/2009	15:13:00	127		0.012		5.09		3.9		0.019		0.0690		4.2		0.46		0.1130								
56HAN-29.3	6/23/2009	13:00:00	84.9		0.010	U	4.35		3.9		1.550		0.0499		4.3		2.07		0.1250								
56HAN-29.3	6/23/2009	17:05:00	85.1		0.015		4.42		4		1.780		0.0540		4.2		1.82		0.1270								
56HAN-29.3	7/28/2009	8:25:00	117		0.022		6.44		4.4		0.173		0.0360		4.6		0.59		0.0729								
56HAN-29.3	7/28/2009	13:53:00	112		0.032		6.9		4.5		0.139		0.0424		5.1		0.64		0.0809								
56HAN-41.2	9/16/2008	11:54:00	115		0.011		6.77		4		0.024		0.0160		4.4		0.41		0.0500								
56HAN-41.2	9/16/2008	16:00:00	115		0.014		6.78		4		0.023		0.0170		4.6		0.45		0.0510								
56HAN-41.2	2/24/2009	11:22:00	33.3		0.046		3.18		5.5		4.200		0.0933		7.5		4.68		0.4450		186		4	U			
56HAN-41.2	2/24/2009	15:24:00	26.2		0.087		2.5		5.9		4.570		0.0947		6.6		4.50		0.8000		584						
56HAN-41.2	6/22/2009	11:30:00	82.6		0.010	U	4.17		3.7		0.923		0.0123		4.6		1.22		0.1030								
56HAN-41.2	6/22/2009	11:30:00	82.4		0.010	U	4.15		3.7		0.939		0.0114		5.9		1.22		0.1090								
56HAN-41.2	6/22/2009	12:50:00																							2110		380
56HAN-41.2	6/22/2009	15:50:00	83.9		0.010	U	4.14		3.6		0.923		0.0110		5.6		1.23		0.1020								
56HAN-41.2	7/27/2009	11:20:00																							3650		740
56HAN-41.2	7/27/2009	11:55:00	109		0.013		5.63		4.3		0.026		0.0294		4.4		0.36		0.0881								
56HAN-41.2	7/27/2009	11:55:00	108		0.014		5.63		4		0.027		0.0306		4.1		0.37		0.0907								
56HAN-41.2	7/27/2009	16:10:00	108		0.015		5.49		4.3		0.021		0.0281		4.2		0.36		0.0851								
56HAN-46.3	6/22/2009	10:25:00	76		0.010	U	4.01		3.8		0.838		0.0233		4.7		1.13		0.1120								
56HAN-46.3	6/22/2009	15:00:00	76.8		0.010	U	4.03		3.9		0.803		0.0220		4.4		1.06		0.0995								
56HAN-46.3	7/27/2009	10:50:00	105		0.029		4.34		3.7		0.414		0.0561		4		0.76		0.0911								
56HAN-46.3	7/27/2009	15:25:00	102		0.027		4.17		4.1		0.232		0.0518		4.3		0.58		0.0821								
56HAN-47.0	6/22/2009	8:45:00	72.1		0.010	U	3.98		3.9		0.635		0.0189		4.4		0.92		0.1080								
56HAN-47.0	6/22/2009	14:05:00	72		0.010	U	4.02		3.9		0.587		0.0189		4.4		0.86		0.1070								
56HAN-47.0	7/27/2009	9:30:00	97.7		0.010	U	3.99		3.7		0.010	U	0.0356		4.2		0.35		0.0826								
56HAN-47.0	7/27/2009	14:20:00	94.7		0.011		4.3		4.3		0.010	U	0.0443		4.3		0.36		0.0796								
56HAN-50.5	6/22/2009	13:35:00	70.8		0.010	U	3.57		3.8		0.728		0.0356		3.9		0.96		0.1350								
56HAN-50.5	6/22/2009	17:00:00	70.7		0.010	U	3.53		3.8		0.719		0.0352		4.3		0.94		0.1280								
56HAN-50.5	7/27/2009	8:25:00	93.8		0.019		5.27		4		0.039		0.0513		4.2		0.39		0.1030								
56HAN-50.5	7/27/2009	13:35:00	91.9		0.010	U	5.27		4.1		0.027		0.0512		4.4		0.37		0.0980								
56HAN-54.3	9/16/2008	10:46:00	120		0.032		8.75		3.1		0.524		0.2710		3.4		0.87		0.3050								
56HAN-54.3	9/16/2008	10:50:00	120		0.030		8.59		3.3		0.527		0.2750		3.4		0.84		0.3100								

Location ID	Date	Time	Alk		NH3		Cl		DOC		NO2/NO3		OP		TOC		TPN		TP		TSS		BOD		Chloro		VOM
56HAN-54.3	9/16/2008	15:16:00	120		0.034		9.09		3		0.551		0.3140		3.4		0.89		0.3400								
56HAN-54.3	2/24/2009	9:51:00	24.8		0.096		2.92		5.9		3.730		0.0789		5.9		3.85		0.3420		195		4	U			
56HAN-54.3	2/24/2009	14:35:00	16.7		0.078		2.38		6.1		3.920		0.0823		7.5		4.02		0.6320		470						
56HAN-54.3	6/22/2009	12:15:00																							1450		230
56HAN-54.3	6/22/2009	12:52:00	70.3		0.035		3.53		3.3		0.715		0.0575		3.7		0.96		0.1430								
56HAN-54.3	6/22/2009	16:30:00	70.2		0.053		3.36		3.6		0.851		0.0750		4		1.13		0.1630								
56HAN-54.3	7/27/2009	12:10:00																							3850		680
56HAN-54.3	7/27/2009	13:14:00	97.2		0.180		7.94		4.1		0.479		0.2540		4.2		1.00		0.3200								
56HAN-54.3	7/27/2009	17:10:00	91.8		0.156		6.2		3.9		0.288		0.1620		4.1		0.85		0.2080								
56HAN-54.9	9/16/2008	10:00:00	112		0.010	U	4.35		3.3		0.010	U	0.0160		3.7		0.26		0.0390								
56HAN-54.9	9/16/2008	14:58:00	112		0.010	U	4.5		3.3		0.010	U	0.0170		3.6		0.29		0.0400								
56HAN-54.9	2/24/2009	10:46:00	24.5		0.028		2.84		4.8		1.750		0.0434		5.6		1.50		0.3290		215						
56HAN-55.1	2/24/2009	10:46:00	24.8		0.028		2.81		5.5		1.410		0.0427		5.1		1.58		0.3330		205						
56HAN-55.8	9/16/2008	8:52:00	106		0.010	U	1.68		2.9		0.010	U	0.0110		3.3		0.25		0.0280								
56HAN-55.8	9/16/2008	8:56:00	106		0.010	U	1.74		3.1		0.010	U	0.0100		3.3		0.24		0.0280								
56HAN-55.8	9/16/2008	14:32:00	106		0.010	U	1.77		2.9		0.010	U	0.0100		3.3		0.24		0.0270								
56HAN-55.8	6/22/2009	10:10:00	59.6		0.031		1.79		4.8		0.564		0.0250		4.9		0.78		0.0987								
56HAN-55.8	6/22/2009	15:05:00	58.7		0.028		1.78		4		0.553		0.0259		4.5		0.79		0.0964								
56HAN-55.8	7/27/2009	10:54:00	66.6		0.018		2		4		0.069		0.0218		4		0.35		0.0588								
56HAN-55.8	7/27/2009	15:08:00	66.5		0.010	U	2.05		3.8		0.079		0.0244		4.1		0.37		0.0594								
56HAN-57.7	9/16/2008	8:35:00	96.1		0.010	U	1.55		3.5		0.010	U	0.0309		3.8		0.27		0.0591								
56HAN-57.7	9/16/2008	14:19:00	95.4		0.010	U	1.48		3.5		0.010	U	0.0301		4		0.27		0.0546								
56HAN-57.7	10/29/2008	10:10:00	102		0.010	U	2.04		2.3	J	0.010		0.0100		2.5	J	0.20		0.0260		2						
56HAN-57.7	11/19/2008	9:50:00	36		0.075		4.87		9.6		0.932		0.0508		10.3		1.35		0.1660		7						
56HAN-57.7	12/17/2008	9:37:00	41	J	0.044		4.76		5.2		0.905		0.0439		6.8		0.95		0.1040		2						
56HAN-57.7	1/21/2009	0:00:00	27.6		0.014		3.18		5.2		2.510		0.0406		5.7		3.96		0.1060		7						
56HAN-57.7	1/21/2009	9:55:00	27.5		0.015		3.03		5.5		2.450		0.0407		5.2		2.63		0.1130		6						
56HAN-57.7	2/18/2009	9:25:00	30.9		0.010	U	2.9		4.4		2.540		0.0295		4.8		2.09		0.0785		10						
56HAN-57.7	2/24/2009	9:38:00	21.1		0.041		2.46		5.7		1.090		0.0394		7.1		1.38		0.4790		427		4	U			
56HAN-57.7	2/24/2009	14:23:00	16.3		0.041		2.53		6.1		1.950		0.0523		6.9		1.66		0.6660		550						
56HAN-57.7	3/4/2009	10:08:00	15.9		0.014		1.65		7.7		1.660		0.0448		7.5		3.06		0.1860		78						
56HAN-57.7	3/18/2009	10:45:00	21.2		0.014		2.11		5.7		3.240		0.0606		5.9		3.30		0.1820		63						
56HAN-57.7	4/1/2009	8:45:00	23		0.022		3		6.1		2.290		0.0526		5.6		2.51		0.2090		70						
56HAN-57.7	4/15/2009	11:25:00	17.1		0.010	U	1.49		4.4		0.904		0.0380		4.6		1.04		0.0914		26						
56HAN-57.7	5/6/2009	9:48:00	26.6		0.013		2.89		5.8		0.641		0.0293		6.9		0.87		0.1250		22						
56HAN-57.7	5/6/2009	9:48:00	26.4		0.013		2.85		5.8		0.648		0.0283		5.8		0.86		0.1200		22						
56HAN-57.7	5/19/2009	15:00:00	29		0.010	U	1.63		3.6		0.547		0.0193		3.6		0.64		0.0645		12						
56HAN-57.7	6/3/2009	11:43:00	46		0.010	U	1.86				0.560		0.0133		3.2		0.76		0.0462		7						
56HAN-57.7	6/17/2009	10:45:00	52.2		0.031		2.17		3.8		0.772		0.0275		4.5		0.98		0.1150		30						
56HAN-57.7	6/22/2009	9:10:00	54.3		0.029		1.88		3.5		0.600		0.0244		4		0.82		0.1000								
56HAN-57.7	6/22/2009	9:10:00	54.4		0.028		1.8		3.5		0.593		0.0243		3.8		0.85		0.1010								
56HAN-57.7	6/22/2009	11:45:00																							803		340

Location ID	Date	Time	Alk		NH3		Cl		DOC		NO2/NO3		OP		TOC		TPN		TP		TSS		BOD		Chloro		VOM
56HAN-57.7	6/22/2009	14:26:00	54.1		0.024		1.78		3.6		0.588		0.0260		3.7		0.80		0.0907								
56HAN-57.7	7/15/2009	10:35:00	67.5		0.025		2.06		3		0.395		0.0358		3.2		0.60		0.0725		20						
56HAN-57.7	7/27/2009	8:51:00	68.4		0.022		1.86		3.6		0.031		0.0250		3.7		0.29		0.0617								
56HAN-57.7	7/27/2009	8:51:00	69.1		0.020		1.81		3.7		0.033		0.0257		3.7		0.30		0.0629								
56HAN-57.7	7/27/2009	12:45:00																							1390		520
56HAN-57.7	7/27/2009	13:47:00	68.7		0.010	U	2.05		3.5		0.021		0.0235		3.7		0.28		0.0670								
56HAN-57.7	8/19/2009	9:47:00	88.1		0.016		3.17		3.6		0.061		0.0317		3.5		0.32		0.0836		33						
56HAN-57.7	8/19/2009	9:47:00	88.5		0.022		3.12		4		0.060		0.0305		3.7		0.28		0.0713		15						
56HAN-57.7	9/16/2009	10:55:00	102		0.010	U	3.18		3		0.010	U	0.0333		3.9		0.24		0.0799		8						
56-HHWTP-MW1	6/23/2009	10:00:00	221		0.010	U	29.6		1.4		2.400		0.1150		1.5		2.24		0.1090								
56-HHWTP-MW1	6/23/2009	10:00:00	223		0.010	U	28.8		1.6		2.460		0.1130		1.5		2.62		0.1190								
56-HHWTP-MW1	7/28/2009	9:30:00	235		0.010	U	35.6				3.260		0.1050		1.4		3.42		0.1300								
56-HHWTP-MW2	6/23/2009	10:35:00	430		0.010	U	118		2.5		1.840		0.9250		2.4		2.01		1.0700								
56-HHWTP-MW2	7/28/2009	11:10:00	438		0.010	U	115		2.6		0.587		0.9140		2.3		0.78		1.0100								
56-HHWTP-MW3	6/23/2009	11:05:00	378		0.010	U	150		2.3		9.650		0.3150		2.3		10.20		0.3260								
56-HHWTP-MW3	7/28/2009	10:50:00	364		0.010	U	152		2.3		12.500		0.2930		2.3		13.00		0.2870								
56-HHWTP-MW3	7/28/2009	10:50:00	363		0.010	U	151		2.4		12.400		0.2870		2.2		13.00		0.3630								
56LIT-00.0	9/16/2008	9:36:00	134		0.010	U	7.63		3.4		0.013		0.0325		3.8		0.30		0.0584								
56LIT-00.0	9/16/2008	14:46:00	133		0.010	U	7.58		3.3		0.010	U	0.0317		3.8		0.26		0.0575								
56LIT-00.0	6/22/2009	12:00:00	115		0.026		6.04		3.6		0.762		0.0281		3.9		1.08		0.0788								
56LIT-00.0	6/22/2009	15:55:00	113		0.017		5.95		3.5		0.732		0.0259		3.9		1.06		0.0722								
56LIT-00.0	7/27/2009	12:20:00	128		0.018		7.78		3.8		0.023		0.0379		4.3		0.38		0.0822								
56LIT-00.0	7/27/2009	16:30:00	125		0.019		7.67		3.9		0.018		0.0395		4.2		0.42		0.0708								
56LIT-02.3	10/29/2008	10:55:00	114		0.010	U	2.98		1.3	J	0.706		0.0130		1.5	J	0.85		0.0300		4						
56LIT-02.3	10/29/2008	10:55:00	115		0.010	U	3.08		1.3	J	0.705		0.0140		1.5	J	0.81		0.0320		9						
56LIT-02.3	11/19/2008	10:45:00	76.1		0.021		9.36		4.9		0.914		0.0402		5.4		1.33		0.0948		3						
56LIT-02.3	12/17/2008	10:24:00	83.6	J	0.025		7.5		3.7		2.860		0.0285		4.1		3.61		0.0695		3						
56LIT-02.3	1/21/2009	0:00:00	38.3		0.010	U	5.12		6.4		5.010		0.0681		6.4		5.44		0.1270		4						
56LIT-02.3	2/18/2009	10:55:00	43.8		0.010	U	4.99		5.6		4.410		0.0525		5.6		4.89		0.1090		6						
56LIT-02.3	2/24/2009	12:25:00	14.9		0.114		2.12		5.4		4.700		0.0974		7.8		5.37		0.6820		524						
56LIT-02.3	2/24/2009	15:16:00	13.2		0.117		1.98		5.6		5.060		0.0980		7.2		5.31		0.7480		693						
56LIT-02.3	3/4/2009	11:00:00	16.8		0.041		2.25		8.7		4.900		0.0797		8.1		5.84		0.2490		44						
56LIT-02.3	3/18/2009	11:25:00	21.8		0.033		2.91		6		6.900		0.0831		7.2		7.39		0.2060		27						
56LIT-02.3	4/1/2009	9:25:00	26.2		0.010	U	3.55		6		3.500		0.0636		6.1		4.74		0.1980		27						
56LIT-02.3	4/15/2009	12:50:00	30.1		0.010	U	2.89		6.9		2.230		0.0535		7.1		2.46		0.1320		13						
56LIT-02.3	4/15/2009	12:50:00	29.9		0.031		2.82		6		2.680		0.0550		7.1		3.41		0.1320		11						
56LIT-02.3	5/6/2009	11:08:00	50.4		0.029		3.97		7.8		1.460		0.0589		9.4		1.85		0.1670		17						
56LIT-02.3	5/20/2009	11:57:00	66.8		0.010	U	3.88		5.5		1.270		0.0296		5.6		1.54		0.1140		7						
56LIT-02.3	6/3/2009	12:35:00	91.2		0.010	U	4.01		4.1		1.160		0.0168		4.2		1.46		0.0489		4						
56LIT-02.3	6/17/2009	11:30:00	104		0.017		4		3.3		1.200		0.0278		3.5		1.45		0.0630		5	J					
56LIT-02.3	6/22/2009	10:58:00	104		0.010	U	4.11		3.1		1.230		0.0259		3.5		1.52		0.0671								
56LIT-02.3	6/22/2009	15:30:00	103		0.010	U	4.1		3.2		1.210		0.0260		3.3		1.51		0.0613								

Location ID	Date	Time	Alk		NH3		Cl		DOC		NO2/NO3		OP		TOC		TPN		TP		TSS		BOD		Chloro		VOM
56LIT-02.3	7/15/2009	12:10:00	110		0.013		3.81		3.5		0.472		0.0565		3.5		0.73		0.0864		4						
56LIT-02.3	7/15/2009	12:10:00	112		0.012		3.77		3.4		0.470		0.0592		3.5		0.74		0.0828		4						
56LIT-02.3	7/27/2009	11:33:00	118		0.018		5.11		3.5		0.345		0.0309		3.7		0.68		0.0600								
56LIT-02.3	7/27/2009	15:44:00	116		0.017		5.09		3.3		0.320		0.0362		3.6		0.66		0.0535								
56LIT-02.3	8/19/2009	10:46:00	118		0.019		4.82		2.8		0.298		0.0539		13.2		0.60		0.0757		6						
56LIT-02.3	9/16/2009	11:30:00	116		0.016		4.17		1.7		0.524		0.0399		2.2		0.72		0.0562		2						
56MAR-00.0	9/17/2008	12:02:00	110		0.024		9.36		1.8		1.290		0.0610		2.1		1.47		0.0915								
56MAR-00.0	9/17/2008	17:08:00	110		0.031		9.44		1.8		1.280		0.0604		2.1		1.43		0.1090								
56MAR-00.0	2/25/2009	10:27:00	101		0.010	U	8.53		4.7		2.510		0.0707		4.9		2.94		0.0937		5						
56MAR-00.0	2/25/2009	16:20:00	98.9		0.010	U	8.35		4.5		2.100		0.0739		4.8		2.33		0.1010		7						
56MAR-00.0	6/24/2009	8:37:00	105		0.019		9.05		1.8		1.120		0.0533		2		1.32		0.0839		12						
56MAR-00.0	6/24/2009	13:53:00	103		0.025		9.08		1.9		1.130		0.0554		2.1		1.35		0.0899		12						
56MAR-00.0	7/29/2009	9:00:00	105		0.040		9.97		2.1		1.060		0.0715		2.5		1.31		0.1030								
56MAR-00.0	7/29/2009	13:15:00	106		0.037		10		2.1		1.090		0.0718		2.3		1.30		0.0969								
56MAR-05.3	9/17/2008	11:37:00	104		0.011		9.29		1.4		1.800		0.0766		1.7		1.96		0.0908								
56MAR-05.3	9/17/2008	16:50:00	103		0.017		9.37		1.5		1.490		0.0731		1.8		1.82		0.0826								
56MAR-05.3	6/24/2009	7:35:00	100		0.010	U	9.39		1.4		1.970		0.0536		1.6		2.59		0.0691		8						
56MAR-05.3	6/24/2009	13:06:00	96.3		0.010	U	9.33		1.5		1.590		0.0519		1.8		1.76		0.0767		12						
56MAR-05.3	7/29/2009	8:00:00	99.8		0.011		10		1.4		1.590		0.0619		1.7		1.80		0.0706								
56MAR-05.3	7/29/2009	12:38:00	98		0.010	U	10.2		1.6		1.530		0.0611		1.8		1.70		0.0773								
56NFR-03.8	10/29/2008	13:00:00	189		0.010	U	127		9.3	J	0.307		0.4640		9.4	J	1.22		0.7220		7						
56NFR-03.8	11/19/2008	15:15:00	95		0.122		40.2		9.4		3.420		0.3750		9.6		4.37		0.4330		2						
56NFR-03.8	12/17/2008	13:36:00	119	J	0.010		48.9		5.5		3.170		0.1390		6.1		3.63		0.1900		2						
56NFR-03.8	1/21/2009	0:00:00	59.2		0.157		23.7		6.2		3.640		0.2020		6.4		4.49		0.2830		4						
56NFR-03.8	2/18/2009	15:10:00	81.4		0.437		29.3		6.1		1.780		0.2340		6.2		2.30		0.3180		8						
56NFR-03.8	2/24/2009	12:49:00	30.1		0.266		14		6.4		4.030		0.1260		12.1		4.24		0.8090		413						
56NFR-03.8	2/24/2009	16:33:00	28.4		0.290		11		6.4		3.890		0.1790		6.7		4.52		0.6600		265						
56NFR-03.8	3/4/2009	15:45:00	22.3		0.129		6.31		7.7		5.680		0.1060		7.4		6.48		0.2530		51						
56NFR-03.8	3/17/2009	14:45:00	24.9		0.113		9.13		6.3		7.020		0.1000		6.8		7.61		0.2000		48						
56NFR-03.8	3/17/2009	14:45:00	25.1		0.112		9.16		1	U	6.500		0.1000		5.8		7.54		0.2120		51						
56NFR-03.8	4/1/2009	14:05:00	32.8		0.034		10.3		6.5		3.730		0.0737		6.3		4.34		0.1730		14						
56NFR-03.8	4/14/2009	14:00:00	33.1		0.021		7.96		6.9		1.950		0.0685		7.2		2.52		0.1460		14						
56NFR-03.8	5/6/2009	15:35:00	58.8		0.036		17.7		9		0.387		0.0691		9.6		0.92		0.2120		29						
56NFR-03.8	5/19/2009	12:55:00	81		0.024		16.3		7.5		0.169		0.0824		7.9		0.61		0.2200		11						
56NFR-03.8	6/3/2009	14:39:00	128		0.010	U	18.7		6.6		0.010	U	0.0309		7		0.48		0.1610		11						
56NFR-03.8	6/16/2009	12:35:00	152		0.010	U	24.7		6.2		0.010	U	0.0391		6.8		0.46		0.1610		11						
56NFR-03.8	7/15/2009	15:15:00	177		0.010	U	96		9.3		0.074		0.3640		10		0.97		0.6250		10						
56NFR-03.8	8/19/2009	13:27:00	175		0.056		145		12		0.069		1.4800		11.7		1.29		1.7200		9						
56NFR-03.8	9/16/2009	13:23:00	94		0.015		24.2		2.9		0.011		0.5310		3.5		0.33		0.6520		8						
56NFR-03.8	9/16/2009	13:23:00	94.2		0.015		24.2		3.2		0.011		0.5080		3.4		0.32		0.6450		7						
56RAT-00.1	9/16/2008	13:08:00	150		0.010	U	27.2		2.3		1.650		0.1490		2.4		1.86		0.1620								
56RAT-00.1	9/16/2008	16:21:00	149		0.010	U	27.1		2.3		1.740		0.1490		2.4		1.96		0.1620								

Location ID	Date	Time	Alk		NH3		Cl		DOC		NO2/NO3		OP		TOC		TPN		TP		TSS		BOD		Chloro		VOM
56RAT-00.1	2/25/2009	8:59:00	37.4		0.208		8.43		5.3		12.000		0.2160		5.6		13.30		0.3550		42						
56RAT-00.1	2/25/2009	14:40:00	39.2		0.198		8.12		5.8		12.200		0.2160		5.7		13.50		0.3650		80						
56RAT-00.1	2/25/2009	14:40:00	39		0.197		8.07		5.8		12.300		0.2080		5.5		13.30		0.4040		76						
56RAT-00.1	6/22/2009	13:20:00	124		0.010	U	11.9		5.2		4.470		0.2320		5.2		4.92		0.3180								
56RAT-00.1	6/22/2009	17:00:00	127		0.010	U	12.9		4.5		4.340		0.2250		4.6		4.84		0.2920								
56RAT-00.1	7/28/2009	12:45:00	150		0.010	U	25		3.3		1.700		0.2880		3.7		2.36		0.3250								
56RAT-00.1	7/28/2009	17:06:00	150		0.010	U	24.8		3.4		1.610		0.3680		3.6		2.00		0.3270								
56RAT-05.7	6/22/2009	12:35:00	170		0.161		17.6		4.3		2.910		0.0746		4.6		3.12		0.2630								
56RAT-05.7	6/22/2009	16:25:00	185		0.181		19.2		4.3		0.601		0.1050		4.9		1.16		0.4320								
56RAT-05.7	7/27/2009	12:55:00	141		0.103		11.1		4.2		1.780		0.0862		4.2		2.26		0.3940								
56RAT-05.7	7/27/2009	16:50:00	149		0.102		12.1		4.7		1.300		0.0778		4.9		1.87		0.3690								
56ROC-00.5	9/17/2008	9:32:00	148		0.010	U	3.42		2.3		0.155		0.0260		2.6		0.36		0.0340								
56ROC-00.5	9/17/2008	14:50:00	141		0.010	U	3.38		2.5		0.064		0.0210		2.8		0.28		0.0290								
56ROC-00.5	9/17/2008	15:00:00	141		0.010	U	3.32		2.6		0.062		0.0210		2.8		0.29		0.0330								
56ROC-00.5	2/25/2009	13:30:00	28		0.229		5.7		6.1		9.010		0.1360		5.9		8.77		0.3240		59		4	U			
56ROC-00.5	2/25/2009	17:05:00	28		0.225		5.71		6.1		9.400		0.1330		6.1		10.40		0.4090		180						
56ROC-00.5	6/23/2009	9:35:00	140		0.019		4.53		4		1.140		0.0368		4.2		1.50		0.0648								
56ROC-00.5	6/23/2009	15:20:00	140		0.022		4.62		3.9		1.170		0.0344		4.2		1.52		0.0643								
56ROC-00.5	7/28/2009	10:50:00	148		0.011		4.72		3.4		0.080		0.0717		3.5		0.43		0.0917								
56ROC-00.5	7/28/2009	15:52:00	144		0.014		4.81		3.8		0.098		0.0742		4.1		0.51		0.0975								
56ROC-08.9	9/17/2008	9:00:00	142		0.010	U	7.26		2.7		3.330		0.0083		3.1		3.79		0.0270								
56ROC-08.9	9/17/2008	14:32:00	139		0.010	U	7.28		2.8		3.540		0.0085		3.3		3.93		0.0230								
56ROC-08.9	6/22/2009	10:40:00																							4520		880
56ROC-08.9	6/23/2009	10:55:00	117		0.024		5.89		4.7		1.490		0.0361		5		1.80		0.1440								
56ROC-08.9	6/23/2009	15:36:00	117		0.022		5.86		4.6		1.470		0.0355		5.3		1.97		0.1550								
56ROC-08.9	7/27/2009	8:33:00																							2560		287
56ROC-08.9	7/28/2009	10:53:00	142		0.017		9.42		4.6		2.050		0.0137		4.8		2.55		0.0576								
56ROC-08.9	7/28/2009	15:41:00	141		0.023		9.09		4.2		1.660		0.0238		5		2.50		0.0544								
56ROC-12.5	6/23/2009	10:07:00	113		0.060		7.97		4.7		0.666		0.0479		4.8		1.04		0.1480								
56ROC-12.5	6/23/2009	14:55:00	114		0.049		7.82		4.6		0.619		0.0450		4.8		0.99		0.1530								
56ROC-12.5	7/28/2009	9:45:00	147		0.013		16		5.7		0.120		0.0328		5.8		0.75		0.1900								
56ROC-12.5	7/28/2009	14:50:00	148		0.010	U	15.9		5.6		0.040		0.0347		6		0.56		0.0914								
56ROC-13.7	9/17/2008	7:55:00	137		0.010	U	11.2		3.9		0.144		0.0180		4.2		0.47		0.0280								
56ROC-13.7	9/17/2008	13:50:00	138		0.010	U	11		3.9		0.127		0.0180		4.3		0.46		0.0290								
56ROC-13.7	6/23/2009	9:25:00	134		0.010	U	7.83		4.4		0.464		0.0231		4.7	J	0.84		0.0581								
56ROC-13.7	6/23/2009	14:15:00	131		0.014		7.76		4.3		0.413		0.0284		4.5		0.79		0.0631								
56ROC-13.7	7/28/2009	8:56:00	140		0.023		12		5		0.132		0.0583		5.1		0.60		0.1090								
56ROC-13.7	7/28/2009	14:11:00	138		0.031		12.4		4.9		0.149		0.0601		5.4		0.63		0.1020								
56ROC-15.4	6/22/2009	9:15:00																							2970		540
56ROC-15.4	6/23/2009	8:25:00	131		0.011		6.34		4		0.767		0.0149		4.4		1.13		0.0356								
56ROC-15.4	6/23/2009	8:25:00	131		0.016		6.35		4.2		0.754		0.0148		4.3		1.16		0.0366								
56ROC-15.4	6/23/2009	13:55:00	126		0.011		7.14		4.5		0.698		0.0172		4.7		1.09		0.0498								

Location ID	Date	Time	Alk		NH3		Cl		DOC		NO2/NO3		OP		TOC		TPN		TP		TSS		BOD		Chloro		VOM
56ROC-15.4	7/27/2009	9:29:00																							2080		220
56ROC-15.4	7/28/2009	8:16:00	135		0.035		3.38		4.3		0.098		0.0399		4.7		0.55		0.0649								
56ROC-15.4	7/28/2009	8:16:00	136		0.037		3.33		4.6		0.097		0.0406		4.6		0.54		0.0665								
56ROC-15.4	7/28/2009	13:43:00	136		0.031		3.24		4.7		0.098		0.0396		4.8		0.61		0.0629								
56ROC-25.9	10/29/2008	12:00:00	98.2		0.010	U	1.96		1	UJ	0.010	U	0.0130		1.1	J	0.11		0.0290		1						
56ROC-25.9	11/19/2008	12:07:00	93		0.010	U	7.22		2.4		0.187		0.0170		2.6		0.41		0.0230		1	U					
56ROC-25.9	12/17/2008	12:07:00	109	J	0.010	U	5.71		1.7	J	0.719		0.0295		2		0.84		0.0581		3						
56ROC-25.9	1/21/2009	0:00:00	38.6		0.011		3.3		4.5		3.490		0.0641		5.1		3.80		0.1220		9						
56ROC-25.9	2/18/2009	12:48:00	50.2		0.010	U	3.8		3.6		2.340		0.0381		4		2.60		0.0885		8						
56ROC-25.9	2/18/2009	12:48:00	50.5		0.010	U	3.81		3.8		2.490		0.0377		4		2.72		0.0895		9						
56ROC-25.9	2/24/2009	10:15:00	17.1		0.115		2.04		7		5.200		0.0801		5.9		5.19		0.4890		304						
56ROC-25.9	2/24/2009	15:15:00	14		0.177		1.87		5.2		5.220		0.0777		5.8		5.54		0.8430		843						
56ROC-25.9	2/24/2009	15:15:00	14.1		0.136		1.92		5.4		4.780		0.0794		5.7		5.40		0.8530		846						
56ROC-25.9	3/4/2009	13:15:00	15.6		0.047		1.42		6.8		5.790		0.0689		6		5.97		0.2650		84						
56ROC-25.9	3/17/2009	12:05:00	14.9		0.060		1.31		1	UJ	7.180		0.0578		9		7.93		0.4490		443						
56ROC-25.9	4/1/2009	11:40:00	28.5		0.010	U	1.86		4.8		3.360		0.0386		4.8		4.52		0.1570		73						
56ROC-25.9	4/14/2009	11:28:00	25		0.661		1.38		5.4		2.190		0.0382		5.7		3.56		0.1160		16						
56ROC-25.9	5/6/2009	13:25:00	47.8		0.010	U	1.5		6		0.249		0.0269		6.1		0.57		0.1110		15						
56ROC-25.9	5/19/2009	10:50:00	63.9		0.010	U	1.33		4.5		0.356		0.0131		4.8		0.63		0.0687		11						
56ROC-25.9	5/19/2009	10:50:00	64.3		0.010	U	1.41		4.7		0.357		0.0123		4.8		0.62		0.0685		12						
56ROC-25.9	6/3/2009	13:32:00	83.2		0.017		1.13		3.5		0.152		0.0136		3.7		0.50		0.0527		7						
56ROC-25.9	6/16/2009	11:00:00	107		0.048		1.13		3.4		0.091		0.0127	J	3.6		0.43		0.0577		5						
56ROC-25.9	7/15/2009	13:38:00	62.4		0.073		1.29		5.3		0.027		0.0747		6.8		0.42		0.2650		63						
56ROC-25.9	8/19/2009	12:12:00	107		0.023		2.42		2.4		0.012		0.0297		2.5		0.25		0.0696		12						
56ROC-25.9	9/16/2009	12:20:00	114		0.010	U	2.01		2		0.010	U	0.0196		2.1		0.19		0.0412		6						
56ROCWTPDR	9/17/2008	14:12:00	84.5		0.010	U	30.6		1.3		11.500		0.0613		1.6		12.10		0.0618								
56ROCWTPDR	6/23/2009	11:19:00	94.5		0.259		48.1		1.1		6.470		0.0460		1.2		7.16		0.0794				2	U			
56ROCWTPDR	7/28/2009	10:40:00	87		0.010	U	46.8		1.1		9.250		0.0759		1		9.20		0.0676				2	U			
56ROCWWTP	1/21/2009	0:00:00	231		10.700		48.9		9.7		0.128		3.0400		12.2		12.00		3.4800		8						
56ROCWWTP	1/21/2009	14:15:00	230		10.600		48.9		9.2		0.126		3.0500		11.8		12.30		3.5100		7						
56ROCWWTP	2/18/2009	13:55:00	217		10.800		47.1		9.3		0.191		2.8000		13.3		10.80		3.3100		13						
56ROCWWTP	2/25/2009	8:30:00	203		9.680		45.7		9.1		0.204		2.4500		16.4		10.20		2.6600		17						
56ROCWWTP	2/25/2009	15:30:00	201		9.550		45.7		8		0.206		2.5200		16		10.70		2.7200		20						
56ROCWWTP	3/18/2009	13:45:00	147		5.450		38.8		6.2		1.940		1.3600		15.6		7.68		1.8700		24						
56ROCWWTP	4/15/2009	16:06:00	123		1.230		38		5.9		2.190		0.7460		8.1		5.16		1.1300		23						
56ROS-01.7	10/29/2008	12:30:00	100		0.010	U	2.22		1.5	J	1.110		0.0240		1.6	J	1.32		0.0330		1						
56ROS-01.7	11/19/2008	13:37:00	91		0.010	U	5.52		3.8		1.290		0.0366		4.1		1.63		0.0420		1	U					
56ROS-01.7	11/19/2008	13:37:00	90.5		0.015		5.49		3.8		1.330		0.0368		4.3		1.73		0.0420		1	U					
56ROS-01.7	12/17/2008	13:04:00	112	J	0.010	U	7.19		3		3.220		0.0410		3.3		3.07		0.0531		1						
56ROS-01.7	1/21/2009	0:00:00	58.3		0.010	U	6.97		4.9		5.440		0.0779		5.1		5.77		0.1260		13						
56ROS-01.7	2/18/2009	14:33:00	67.5		0.010	U	4.89		3.8		3.990		0.0449		4.1		4.12		0.0791		4						
56ROS-01.7	2/24/2009	11:40:00	28.7		0.304		3.46		7.1		7.190		0.1300		7		6.73		0.6060		83						

Location ID	Date	Time	Alk		NH3		Cl		DOC		NO2/NO3		OP		TOC		TPN		TP		TSS		BOD		Chloro		VOM
56ROS-01.7	2/24/2009	15:50:00	28.2		0.288		3.26		6.3		7.900		0.1330		6.7		7.31		0.6340		205						
56ROS-01.7	3/4/2009	14:35:00	26.2		0.116		3.5		7.9		8.280		0.1170		7.9		8.18		0.2730		30						
56ROS-01.7	3/17/2009	13:55:00	28.5		0.098		3.23		1	UJ	8.660		0.1010		7		9.27		0.2740		57						
56ROS-01.7	4/1/2009	12:40:00	39.5		0.010	U	4.75		6		5.990		0.0638		5.9		7.65		0.1650		19						
56ROS-01.7	4/14/2009	12:40:00	41.1		0.014		3.63		6.3		4.410		0.0618		6.8		4.74		0.1240		7						
56ROS-01.7	4/14/2009	12:40:00	40.8		0.013		3.62		6.3		4.360		0.0647		6.7		5.58		0.1340		8						
56ROS-01.7	5/6/2009	14:50:00	75.6		0.010	U	6.13		7.9		1.360		0.0209		8.7		1.89		0.0929		11						
56ROS-01.7	5/19/2009	12:02:00	100		0.010	U	3.13		5.7		1.050		0.0227		6.2		1.37		0.0722		6						
56ROS-01.7	6/3/2009	14:09:00	118		0.021		3.19		4.5		1.400		0.0259		4.3		1.79		0.0683		9						
56ROS-01.7	6/16/2009	11:45:00	130		0.059		3.15		4		1.310		0.0356		4.1		1.67		0.0750		6						
56ROS-01.7	6/16/2009	11:45:00	131		0.056		3.71		3.8		1.280		0.0340		4.1		1.69		0.0742		3						
56ROS-01.7	7/15/2009	14:30:00	131		0.039		5.7		5.1		0.708		0.0746		5.4		1.14		0.1010		3						
56ROS-01.7	8/19/2009	12:50:00	133		0.054		5		3.3		1.030		0.0654		3.3		1.38		0.0874		2						
56ROS-01.7	9/16/2009	12:50:00	127		0.021		4.16		2.2		1.140		0.0487		2.7		1.41		0.0639		3						
56SPA-00.0	2/25/2009	12:30:00	77.4		0.033		11.1		5.2		6.210		0.2680		5.8		5.98		0.3560		12						
56SPA-00.0	2/25/2009	17:10:00	75.4		0.020		11.9		5.3		6.420		0.2670		5.6		6.92		0.3690		20						
56SPA-00.0	6/23/2009	10:25:00	172		0.010	U	10.2		5.6		2.670		0.2640		4.6		3.08		0.3480								
56SPA-00.0	6/23/2009	16:20:00	174		0.010	U	10.2		5.9		2.610		0.2740		5.8		3.88		0.3370								
56SPA-05.2	6/23/2009	7:50:00	209		0.076		11.6		5.3		4.310		0.3390		5.6		5.11		0.4090								
56SPA-05.2	6/23/2009	13:20:00	206		0.055		12.3		5.6		4.580		0.3550		5.8		5.44		0.4550								
56SPA-05.2	7/28/2009	9:20:00	188		0.278		23.5		4.4		4.290		0.8370		4.7		5.23		1.0800								
56SPA-05.2	7/28/2009	14:35:00	176		0.205		28.8		5.5		7.820		1.0500		5.4		9.40		1.4300								
56SPA-WTP	9/16/2008	12:36:00	82.7		0.075		52.8		8		25.000		4.3200		10.1		30.90		4.2000				7				
56SPA-WTP	10/29/2008	8:50:00	101		0.065		62		6.6	J	19.800		4.1000		7.3	J	20.60		4.1000		6						
56SPA-WTP	11/19/2008	8:30:00	95.8		0.070		56.3		7.1		19.300		3.7400		8.6		21.00		4.1400		8						
56SPA-WTP	12/17/2008	8:04:00	80.1	J	0.363		52.5		6		22.700		3.4000		9.4		21.80		3.5700		9						
56SPA-WTP	1/21/2009	0:00:00	122		0.050		40.5		5.2		19.900		2.2200		6.3		21.40		2.3900		5						
56SPA-WTP	2/18/2009	8:17:00	130		0.087		62.5		6.6		14.500		3.0500		8.3		15.50		3.8800		5						
56SPA-WTP	2/25/2009	12:59:00	123		0.045		42.3		5.8		14.600		2.0900		6.9		15.20		2.3100		8						
56SPA-WTP	3/18/2009	8:55:00	145		0.127		37.4		5.7		17.300		2.2800		6.8		20.40		2.4700		3						
56SPA-WTP	4/15/2009	8:36:00	175		0.140		44.1		6.1		15.400		2.5300		7.2		15.80		2.6200		4						
56SPA-WTP	5/20/2009	9:15:00	158		0.125		54.9		6.3		17.200		4.2300		8.1		16.70		4.2900		3						
56SPA-WTP	6/17/2009	9:15:00	109		0.086		51.3		6.8		25.600		5.1100		8		25.80		5.0100		3						
56SPA-WTP	6/23/2009	13:24:00	107		0.055		51.6		5.7		26.100		5.8300		5.8		27.30		4.0300				2	U			
56SPA-WTP	6/23/2009	13:24:00	106		0.064		54.3		5.6		25.200		4.2100		6.2		27.10		4.3500				2	U			
56SPA-WTP	7/15/2009	9:15:00	95.6		0.113		56.1		7.8		26.100		4.8000		9.9		26.90		5.3300		5						
56SPA-WTP	7/28/2009	14:30:00	75.8		0.149		58.1		7.3		31.100		5.3300		7.5		32.10		5.2100				4	U			
56SPA-WTP	8/19/2009	8:30:00	83.5		0.145		55.3		7		26.100		4.5100		7.9		26.90		4.3700		7						
56SPA-WTP	9/16/2009	8:55:00	78.7		0.136		59.4		5.9		27.500		4.9600		6.7		31.20		5.1600		4						
56STE-00.0	6/24/2009	7:50:00	180		0.023		8.08		2.8		5.930		0.1540		3		5.99		0.1850		7						
56STE-00.0	6/24/2009	13:31:00	179		0.014		8.06		3.1		5.770		0.1600		3.1		6.08		0.1790		5						
56STE-00.0	7/29/2009	7:56:00	190		0.035		9.74		2.1		3.710		0.1400		2.3		3.97		0.1520								

Location ID	Date	Time	Alk		NH3		Cl		DOC		NO2/NO3		OP		TOC		TPN		TP		TSS		BOD		Chloro		VOM
56STE-00.0	7/29/2009	13:05:00	187		0.037		9.63		2.5		4.510		0.1420		2.8		4.00		0.1540								
56TEKWWTP	9/16/2008	10:27:00	144		0.118		25.6		2.5		2.570		1.4300	J	3.2		3.15		1.3600				4	U			
56TEKWWTP	9/16/2008	10:27:00																					4	U			
56TEKWWTP	10/29/2008	9:40:00	135		0.023		17		2J	J	3.650		0.9120		2.4	J	4.27		0.9440		1						
56TEKWWTP	11/19/2008	9:25:00	134		0.388		21.3		3.1		5.990		0.9030		4.4		6.71		0.9880		3						
56TEKWWTP	12/17/2008	9:00:00	130	J	0.044		15.9		2		4.030		0.6580		3		4.24		0.7400		4						
56TEKWWTP	12/17/2008	9:00:00	130	J	0.042		15.7		2		3.990		0.6550		3		4.67		0.7280		4						
56TEKWWTP	1/21/2009	0:00:00	126		0.187		23.1		4.1		6.770		0.5140		5.6		7.75		0.7090		11						
56TEKWWTP	2/18/2009	10:25:00	129		0.092		23.7		3.3		5.380		0.9440		4.2		5.40		1.2700		4						
56TEKWWTP	2/24/2009	9:00:00	109		0.243		17.4		14.3		3.250		0.4460		15.3		3.73		0.6970		27						
56TEKWWTP	2/24/2009	9:00:00	110		0.235		17.2		14		3.300		0.4470		15.1		3.62		0.6780		27						
56TEKWWTP	2/24/2009	13:57:00	108		1.130		20.1		9.5		4.820		0.8490		11.8		6.21		1.1300		24						
56TEKWWTP	3/18/2009	10:05:00	121		0.519		19.9		3.9		5.970		0.5650		4.4		6.55		0.7280		11						
56TEKWWTP	4/15/2009	10:43:00	138		2.240		21.5		4.7		4.430		0.5630		6.4		7.04		0.7130		9						
56TEKWWTP	5/20/2009	11:15:00	135		0.843		21.9		4		5.660		1.1400		4.6		6.59		1.4000		5						
56TEKWWTP	5/20/2009	11:15:00	136		0.862		24.9		3.7		5.660		1.0900		4.2		6.73		1.6600		5						
56TEKWWTP	6/17/2009	10:10:00	142		0.153		22.8		3.3		2.770		0.8730		4.8		3.37		0.9110		5						
56TEKWWTP	6/17/2009	10:10:00	143		0.150		23		3.3		2.920		0.8290		4.7		3.37		1.1200		5						
56TEKWWTP	6/23/2009	9:50:00	133		0.623		23.6		4.4		7.470		1.8200		5.4		8.81		2.1000				11				
56TEKWWTP	7/15/2009	11:30:00	127		0.717		29.1		5.3		2.990		1.2100		5.8		4.17		1.3600		8						
56TEKWWTP	7/28/2009	9:12:00	146		1.150		23.6		3.7		2.140		1.2300		3.7		3.95		1.3200				4	U			
56TEKWWTP	7/28/2009	9:12:00	146		1.150		23.4		3.6		2.130		1.2400		4.2		3.74		1.3100				2	U			
56TEKWWTP	8/19/2009	11:20:00	137		0.312		31.5		4.2		11.100		2.6100		4.5		12.10		2.6500		6						
56TEKWWTP	9/16/2009	10:06:00	112		0.283		97.9		3.8		4.350		1.5600		5		5.60		1.6400		4						
56Unk(LIT-08.6)	1/21/2009	0:00:00	28.1		0.016		8.88		5.2		4.580		0.0561		5.3		5.20		0.0902		1						
56Unk(LIT-08.6)	2/18/2009	11:55:00	30.3		0.010	U	8.73		4.6		4.520		0.0437		4.8		4.71		0.0569		5						
56Unk(LIT-08.6)	2/24/2009	13:13:00	16.2		0.235		4.93		5.5		6.500		0.0972		7.2		6.87		0.2020		74						
56Unk(LIT-08.6)	3/4/2009	11:55:00	13.1		0.092		4.87		6.9		5.850		0.0748		7.5		5.36		0.1780		27						
56Unk(LIT-08.6)	3/18/2009	12:10:00	16.1		0.058		5.71		4.7		6.870		0.0584		5.4		7.28		0.1340		16						
56Unk(LIT-08.6)	4/1/2009	10:00:00	20.9		0.010	U	6.92		5.3		3.500		0.0501		5.1		3.73		0.1220		22						
56Unk(LIT-08.6)	4/1/2009	10:00:00	21		0.010	U	7.15		5		3.130		0.0504		5		3.94		0.1250		20						
56Unk(LIT-08.6)	4/15/2009	14:36:00	21.2		0.010	U	5.94		4.9		1.740		0.0528		5.3		2.84		0.1310		29						
56Unk(LIT-08.6)	5/6/2009	12:12:00	46.7		1.030		3.38		5.8		1.720		0.2940		6		3.55		0.3810		9						
56Unk(LIT-08.6)	5/20/2009	12:45:00	54.1		0.112		6.03		5.4		0.669		0.1450		5.3		0.98		0.2090		10						

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Appendix E. Continuous Temperature Plots

Figure E-1. Griffith Spring above LS Fish Hatchery.

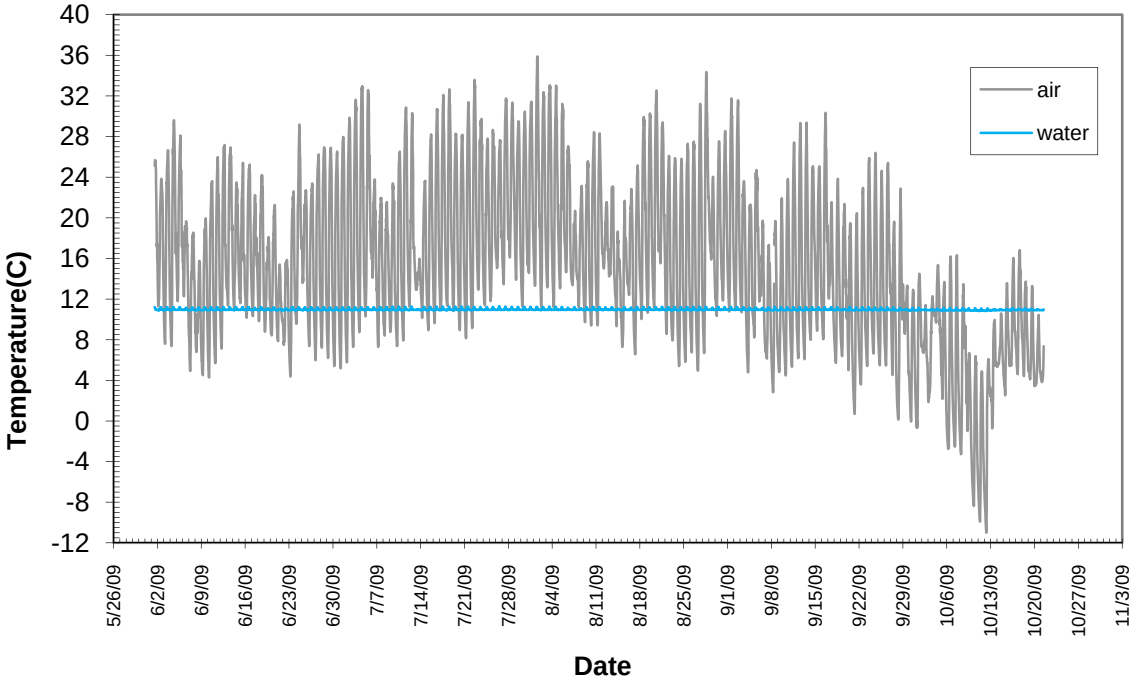


Figure E-2. Phillips Ck. at Cheney - Spangle Rd.

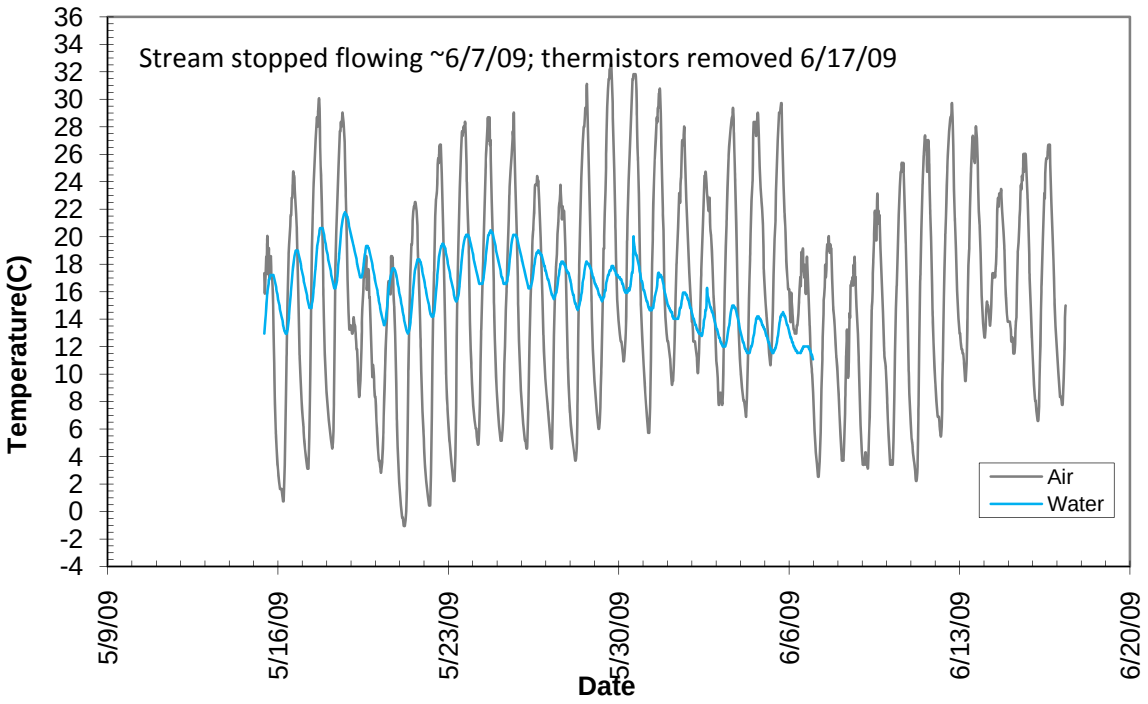


Figure E-3. California Ck. at end of Belmont Rd.

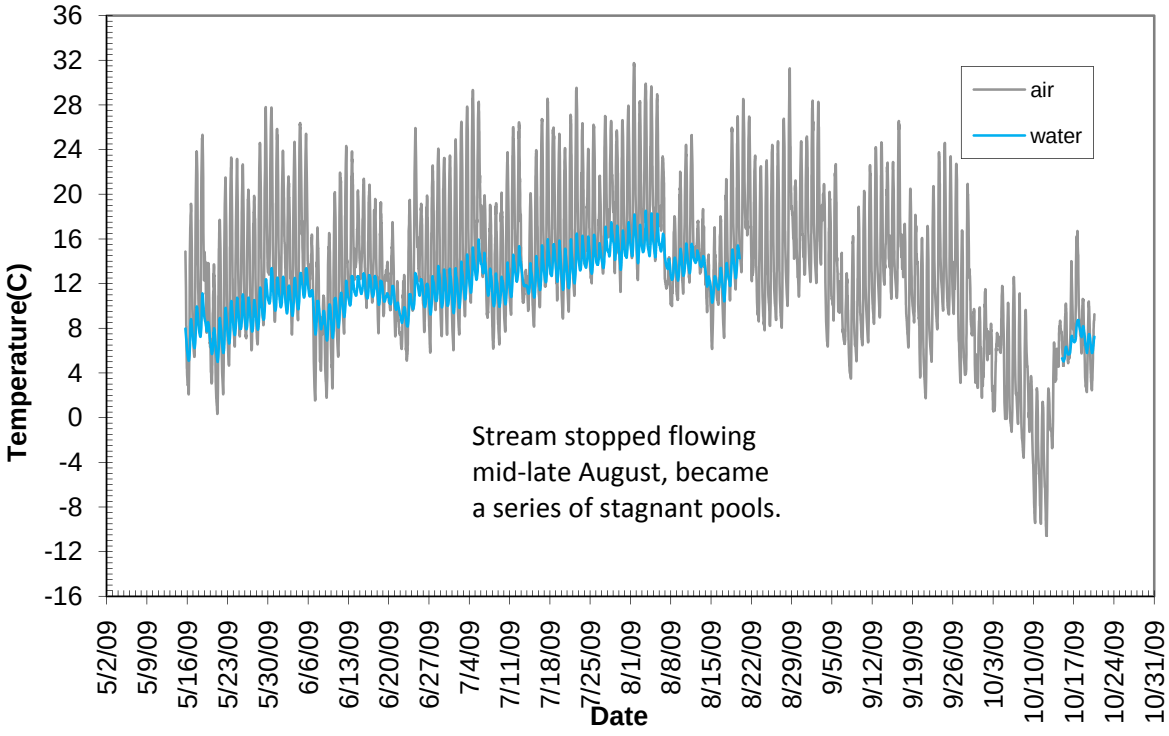


Figure E-4. Cove Ck. at mouth.

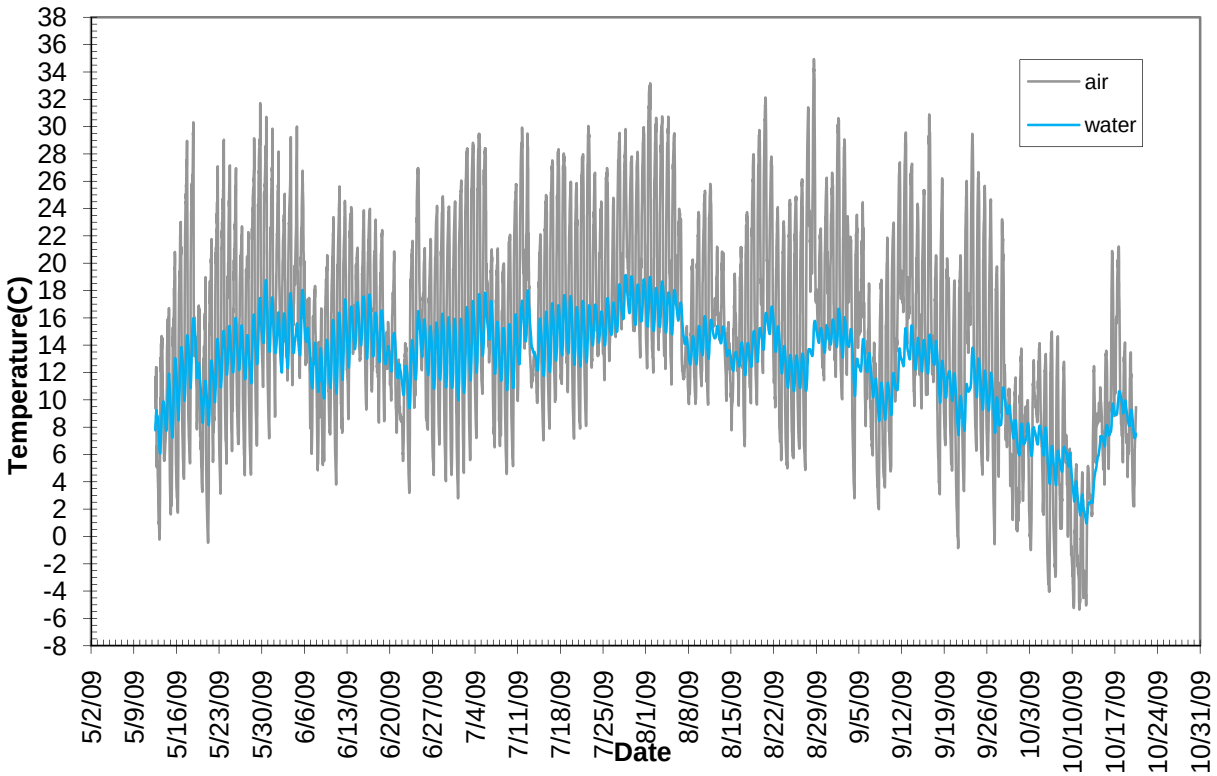


Figure E-5. Rattler Run at mouth.

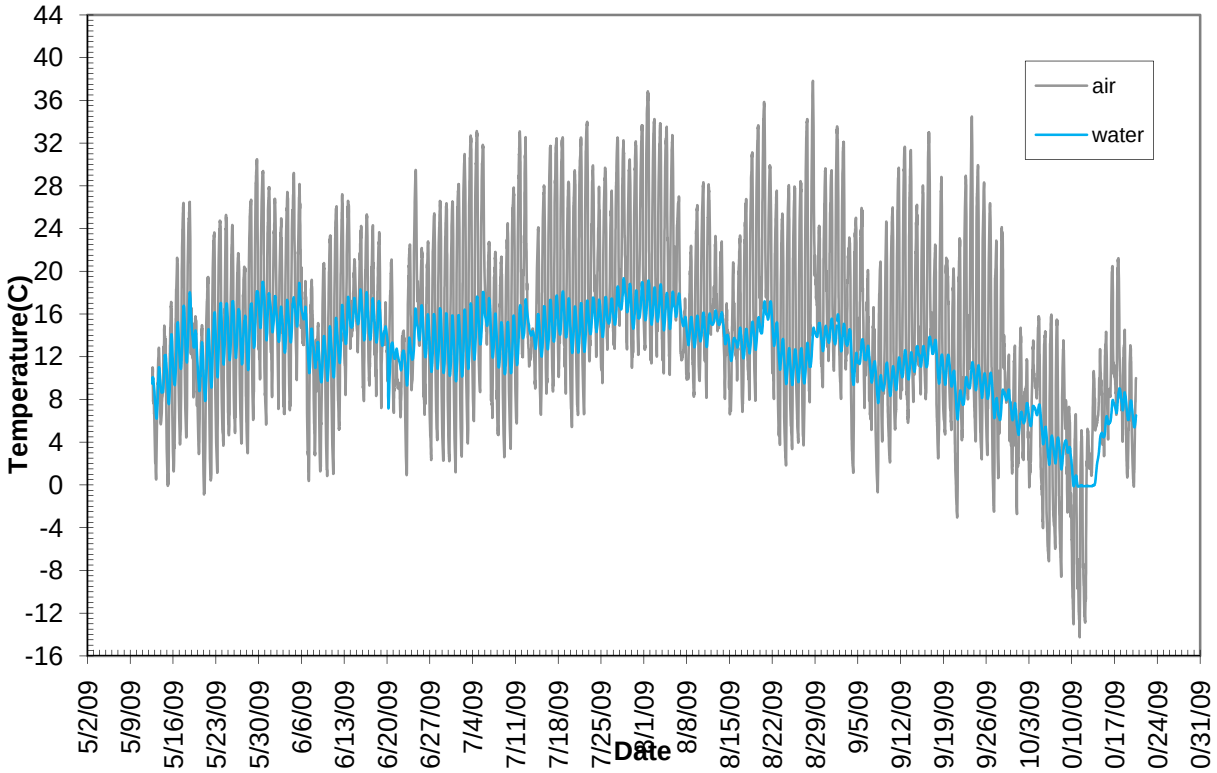


Figure E-6. Unknown Drainage at Agency Rd.

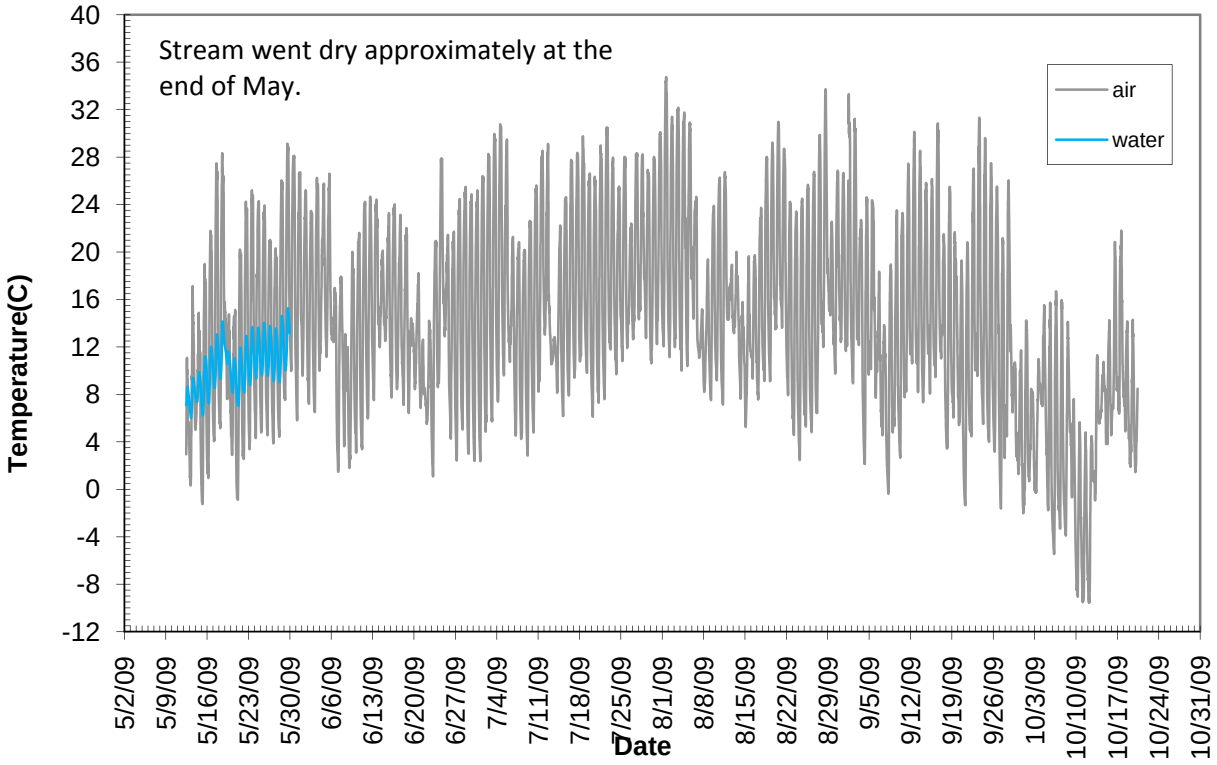


Figure E-7. Spangle Ck. at mouth.

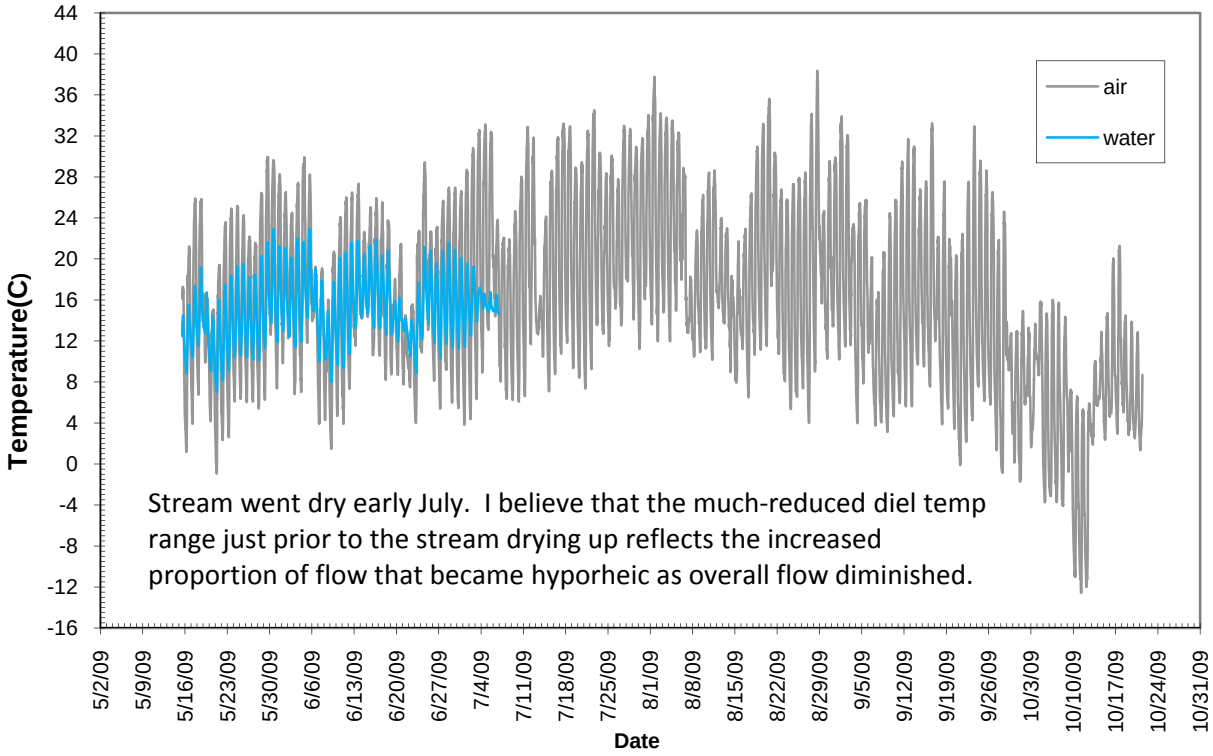


Figure E-8. Spangle Ck. below WWTP.

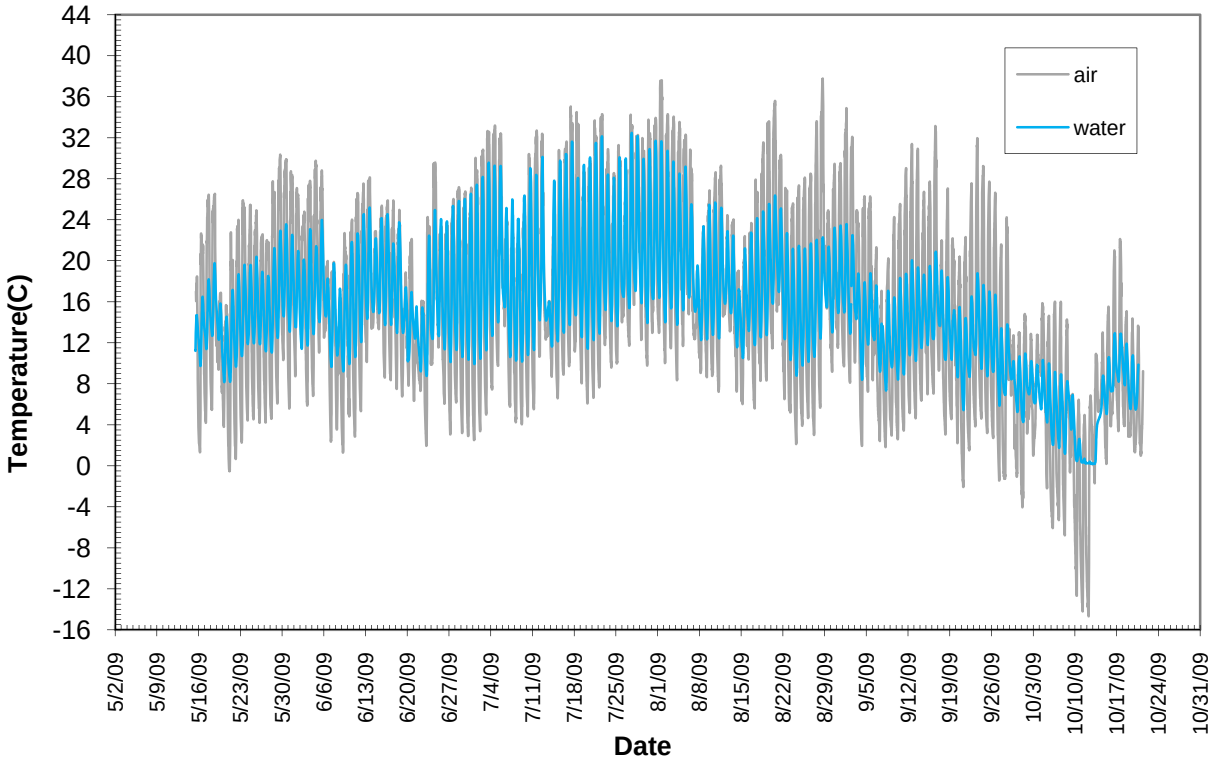


Figure E-9. Marshall Ck. at mouth.

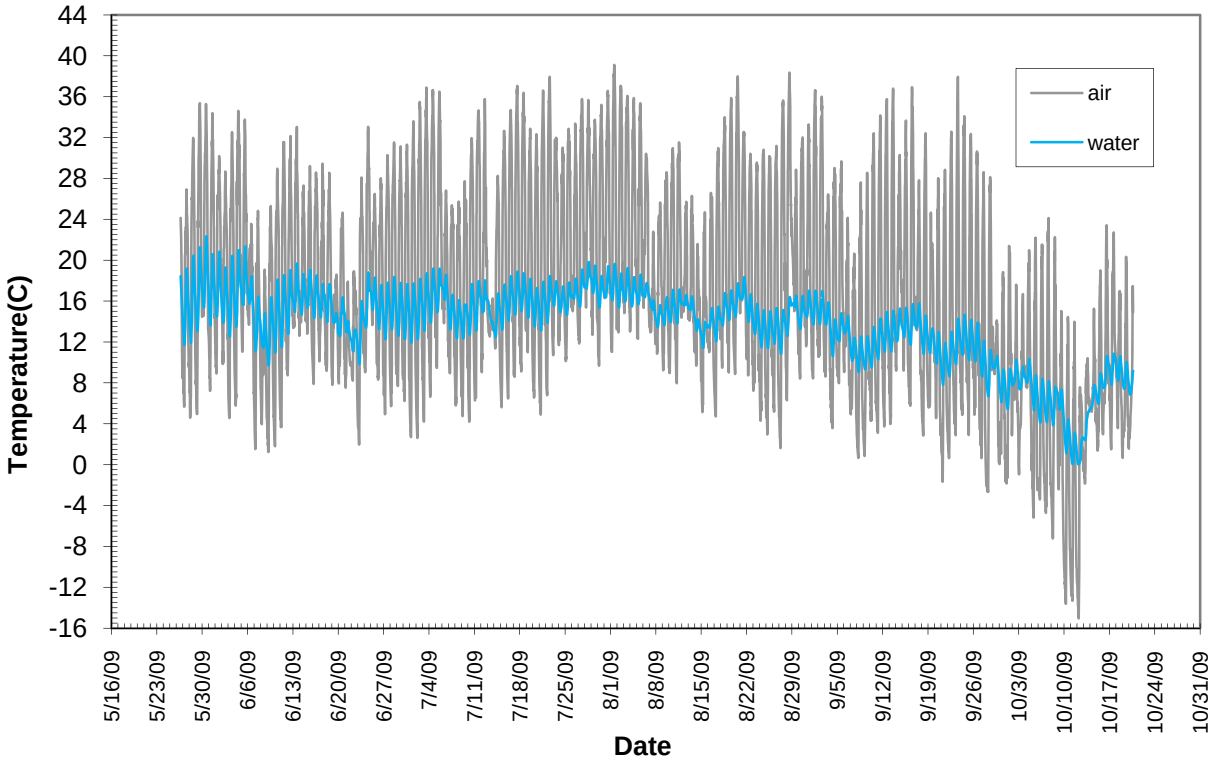


Figure E-10. Marshall Ck. at McKenzie Rd.

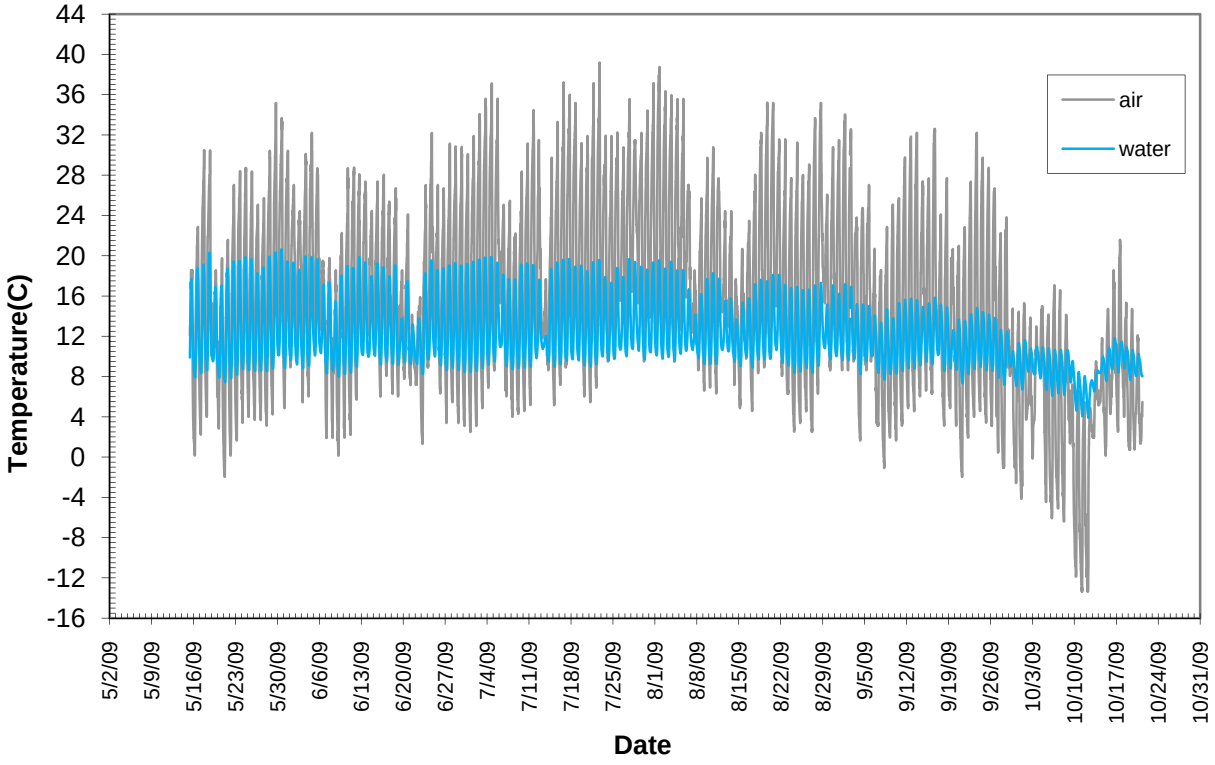


Figure E-11. Rock Ck. at mouth.

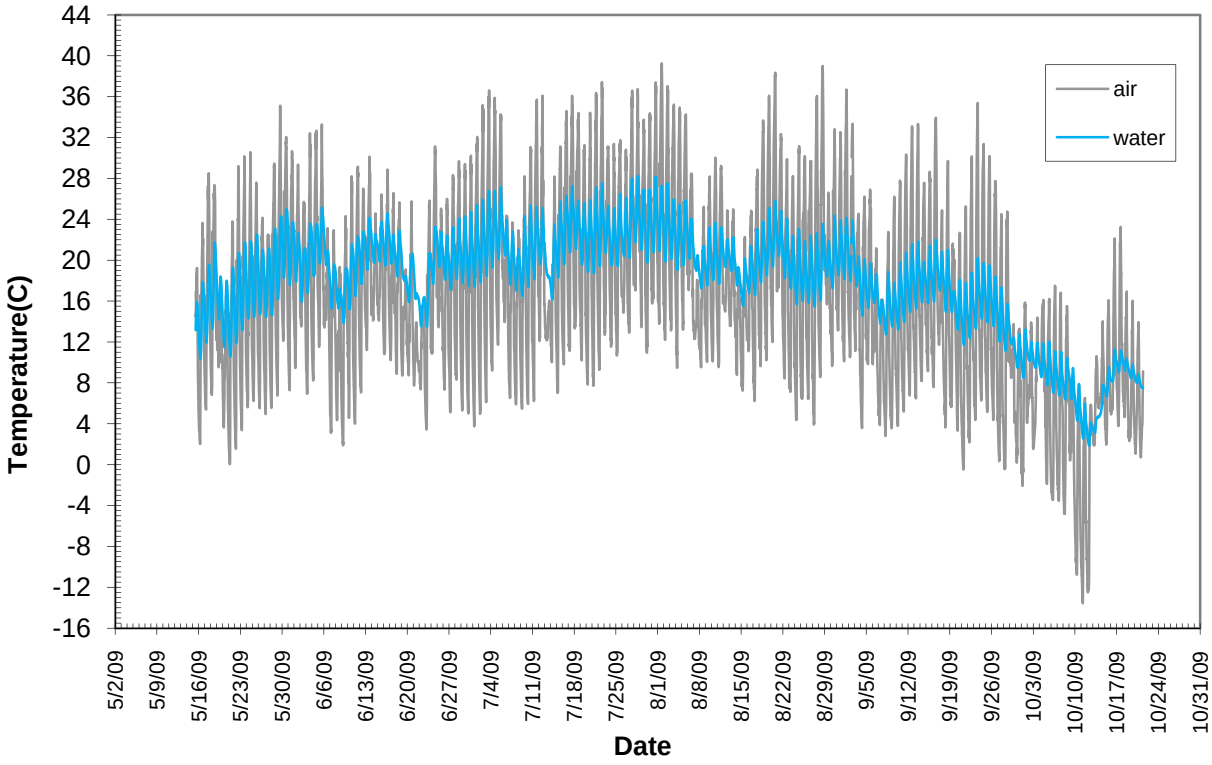


Figure E-12. Rock Ck. at Jackson Rd.

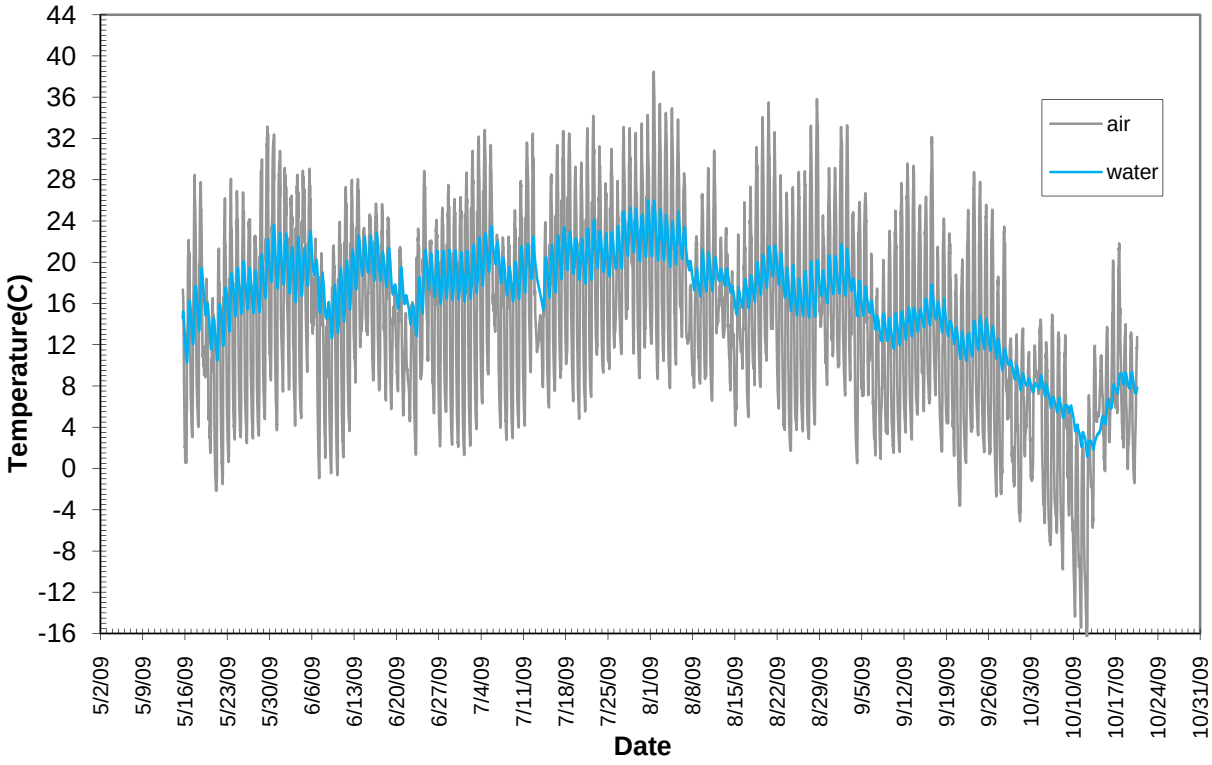


Figure E-13. Rock Ck. at Rockford.

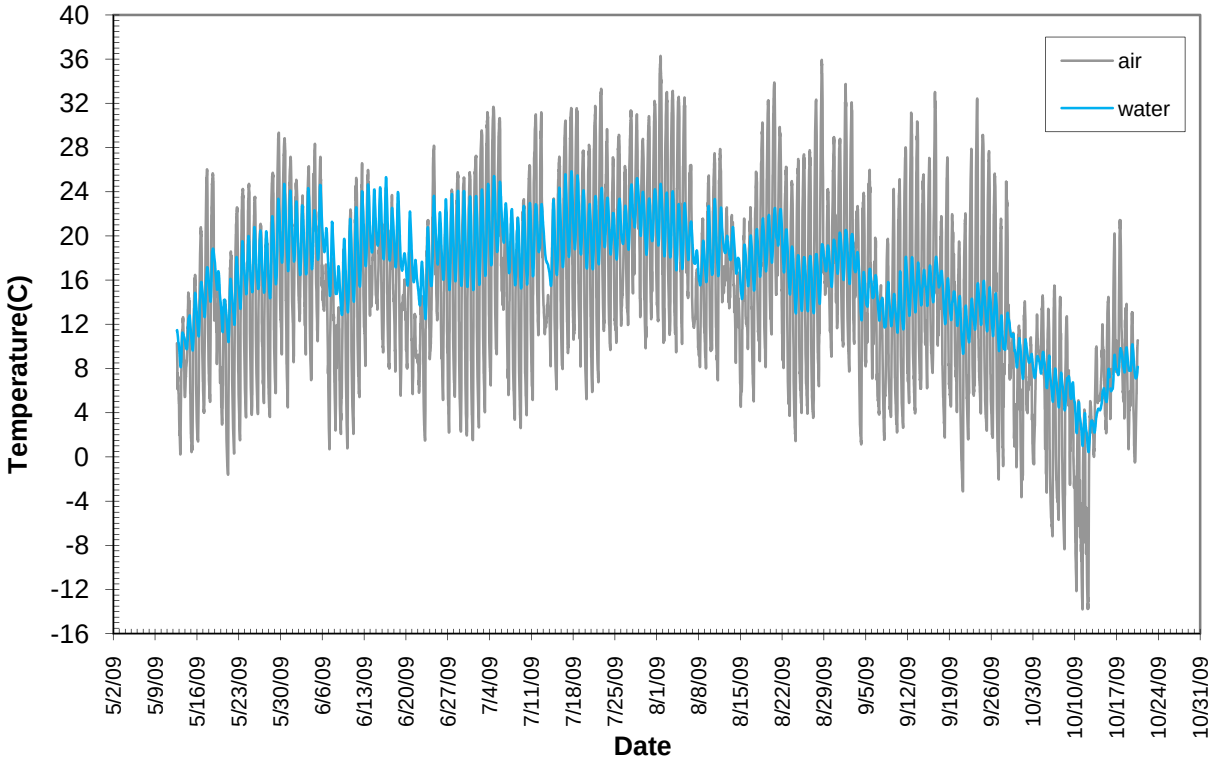


Figure E-14. Rock Ck. below North Fork confluence.

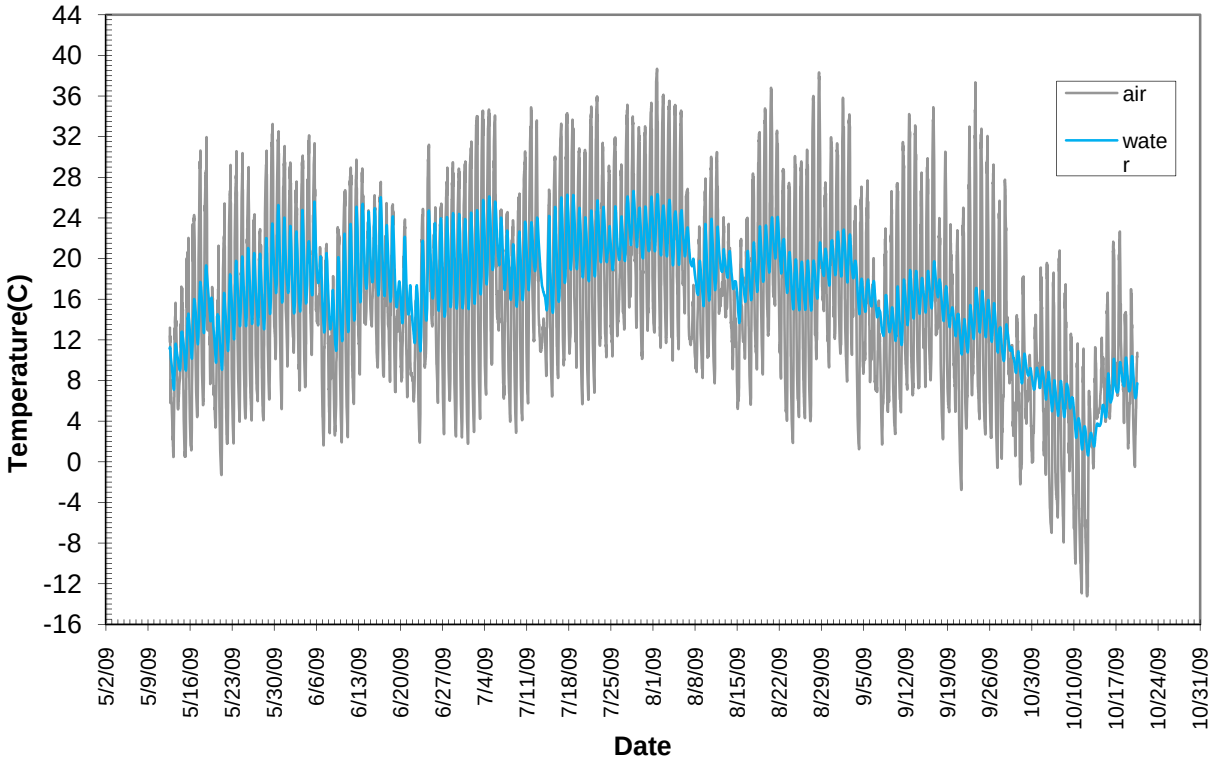


Figure E-15. Little Hangman Ck. at mouth.

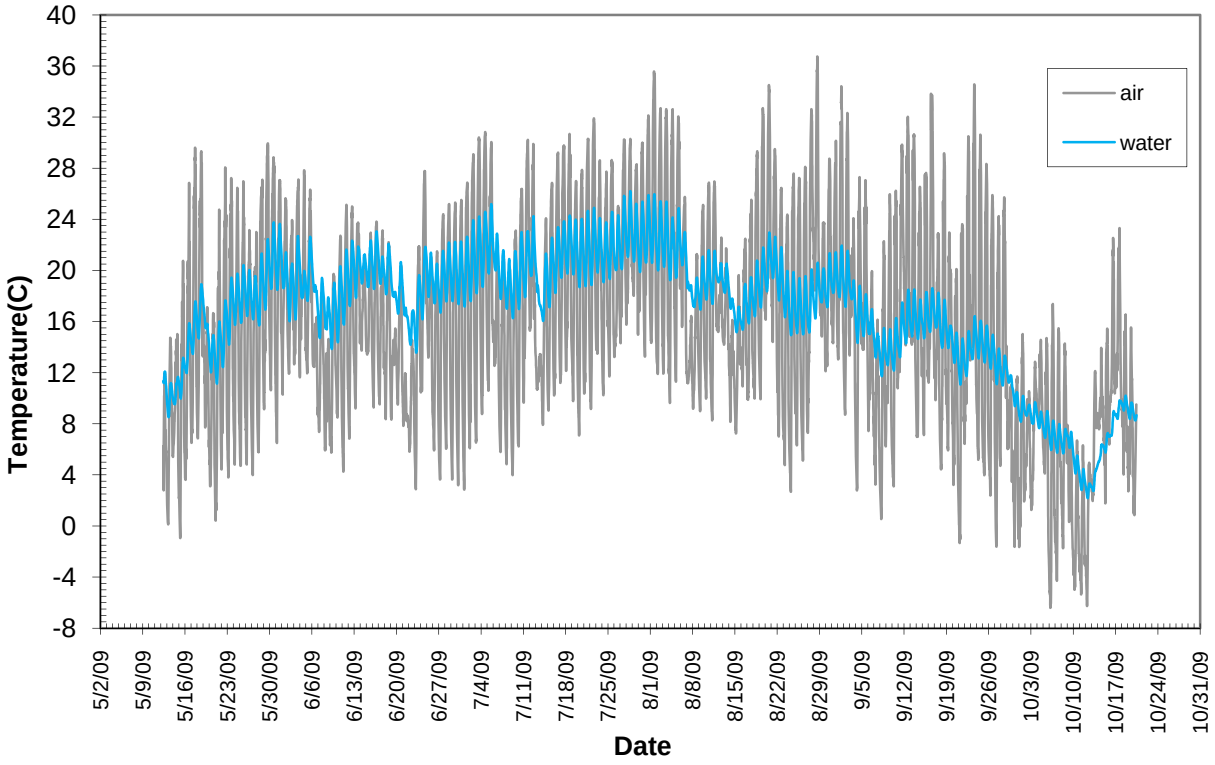


Figure E-16. Hangman Ck. at Bradshaw Rd.

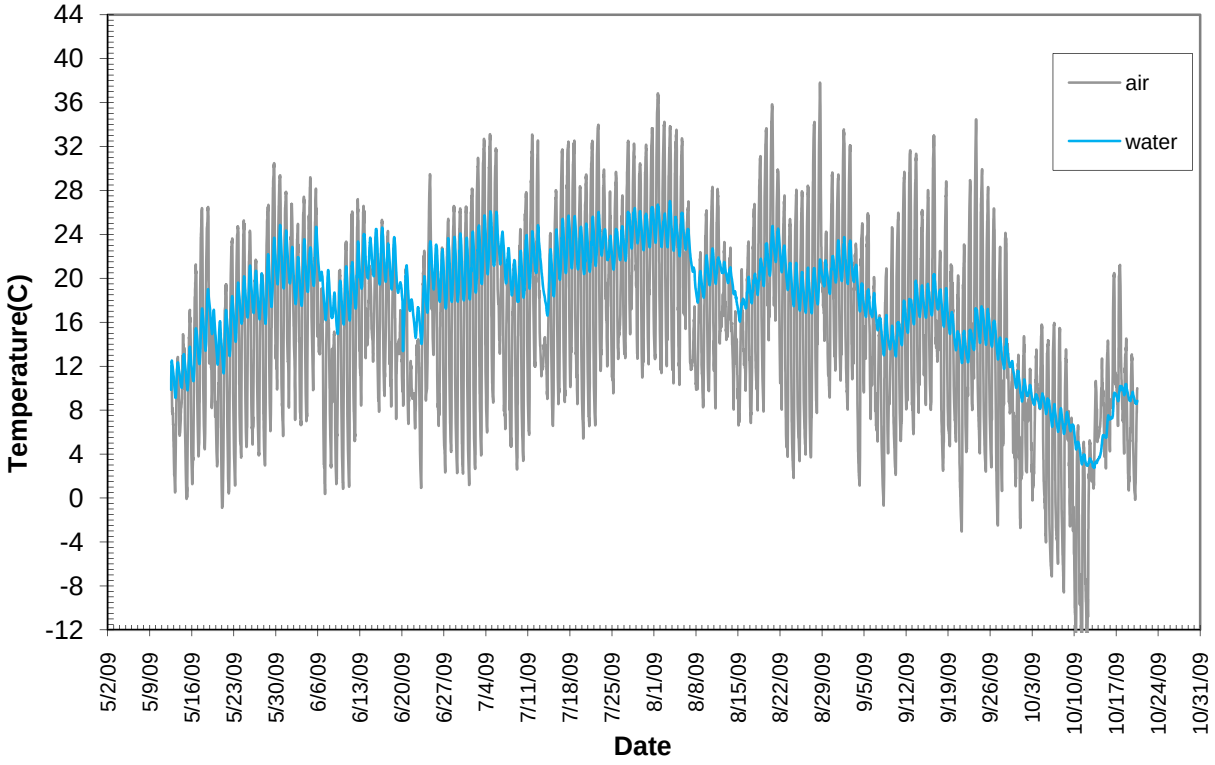


Figure E-16. Hangman Ck. at state line.

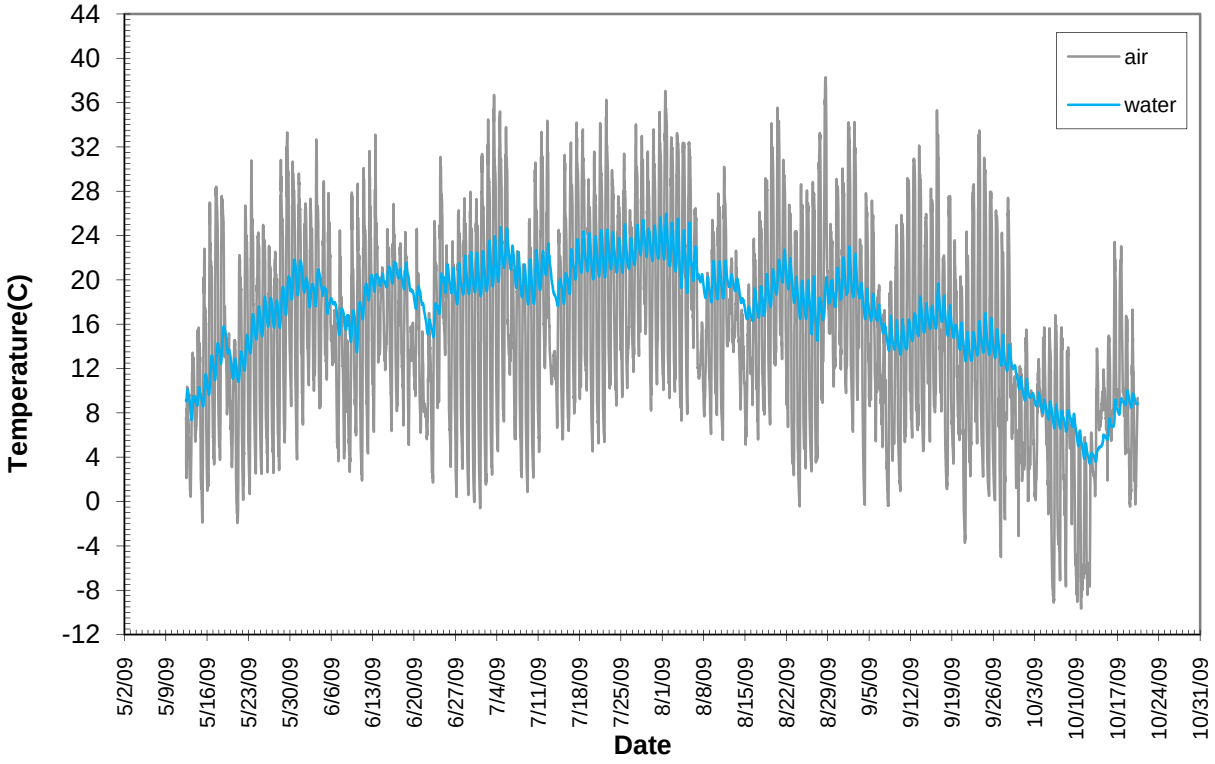


Figure E-17. Hangman Ck. below Tekoa.

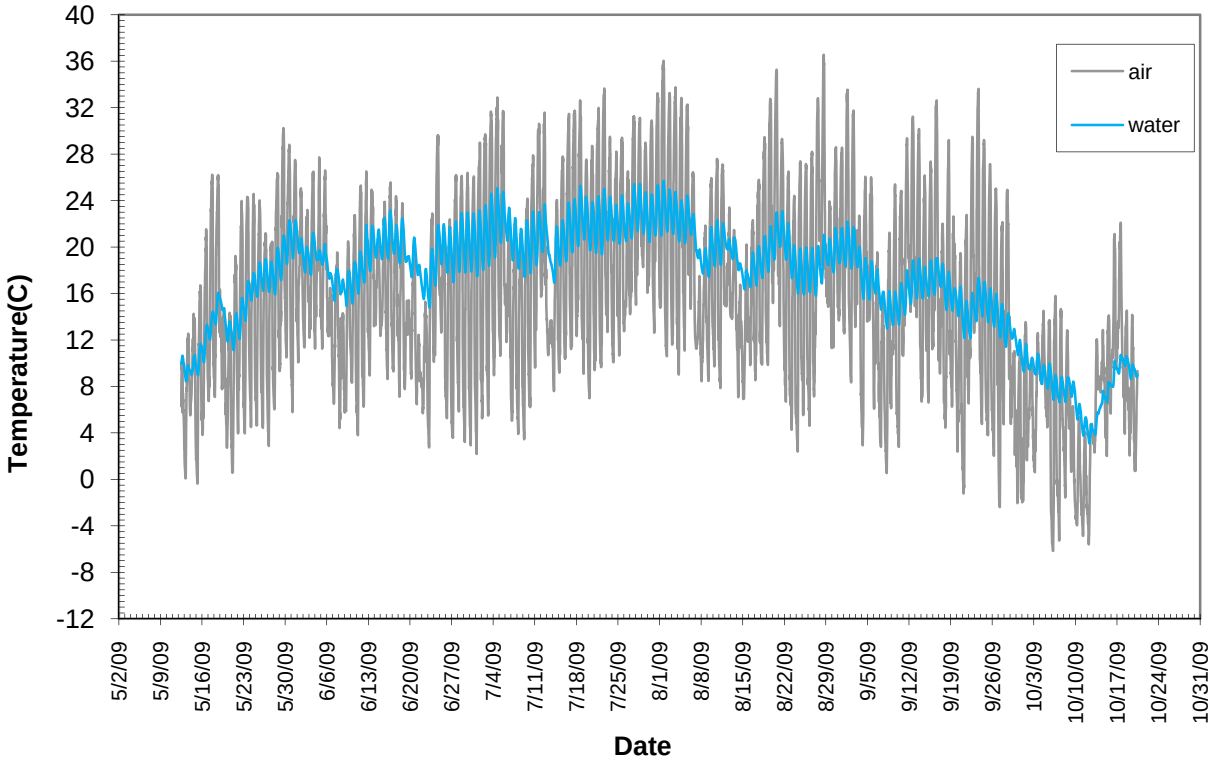


Figure E-18. Hangman Ck. at Roberts Rd.

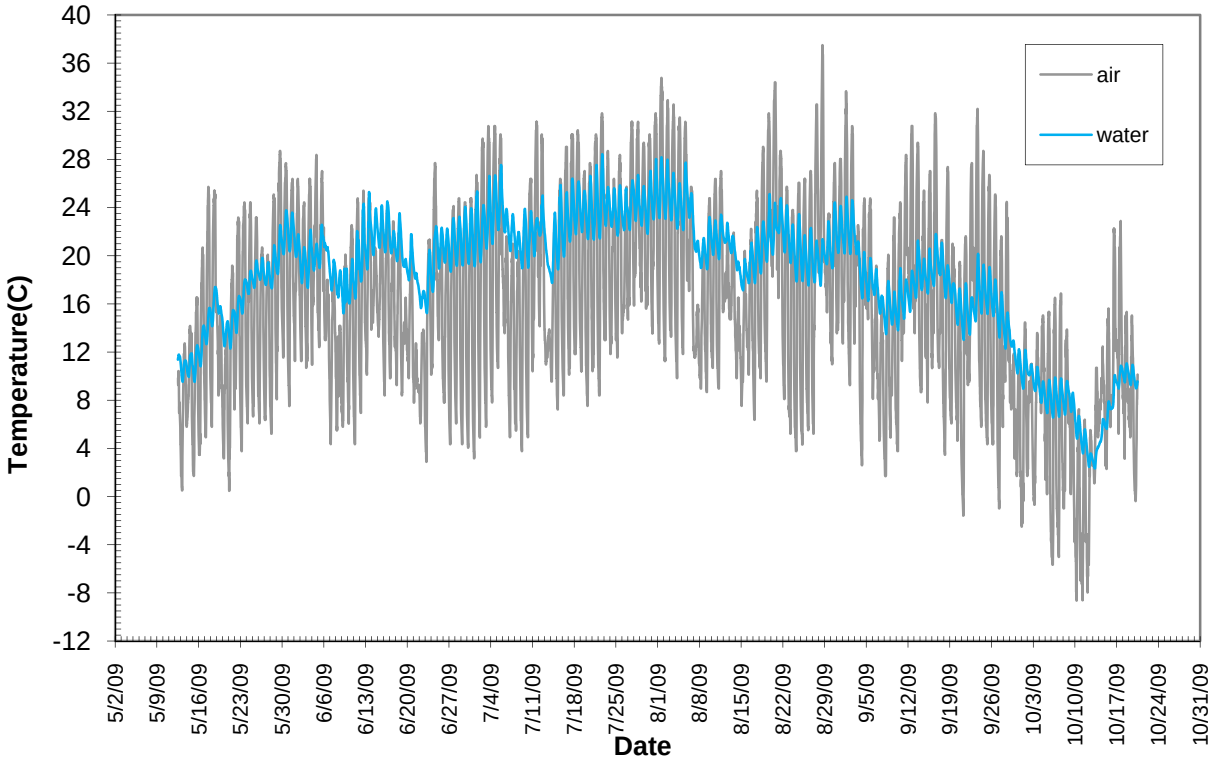


Figure E-19. Hangman Ck. at Latah Ck. Rd.

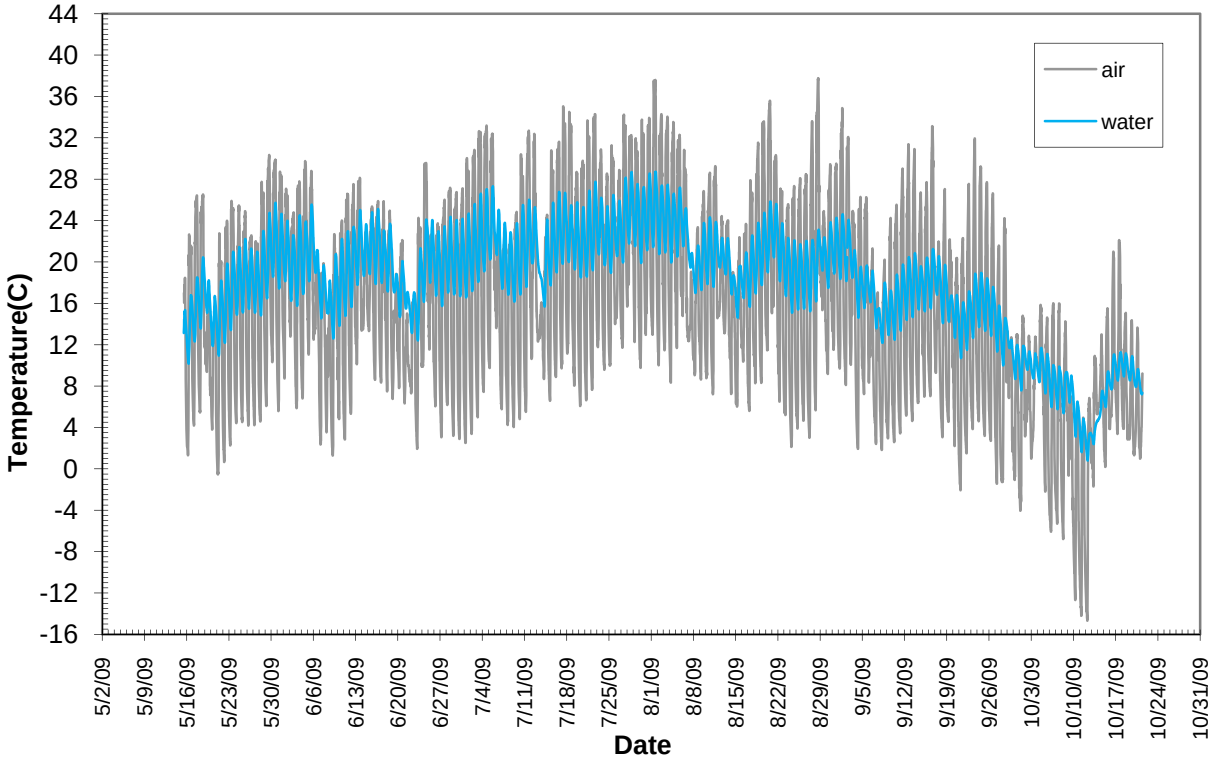


Figure E-20. Hangman Ck. at Duncan.

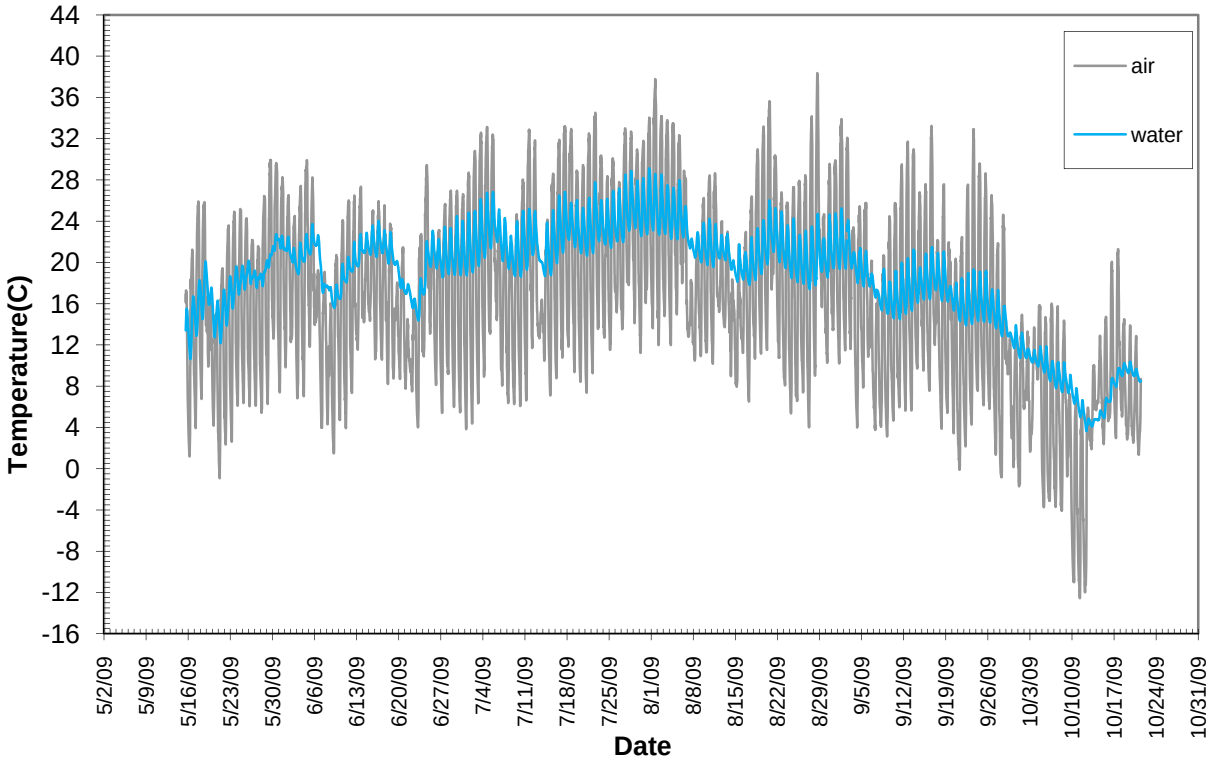
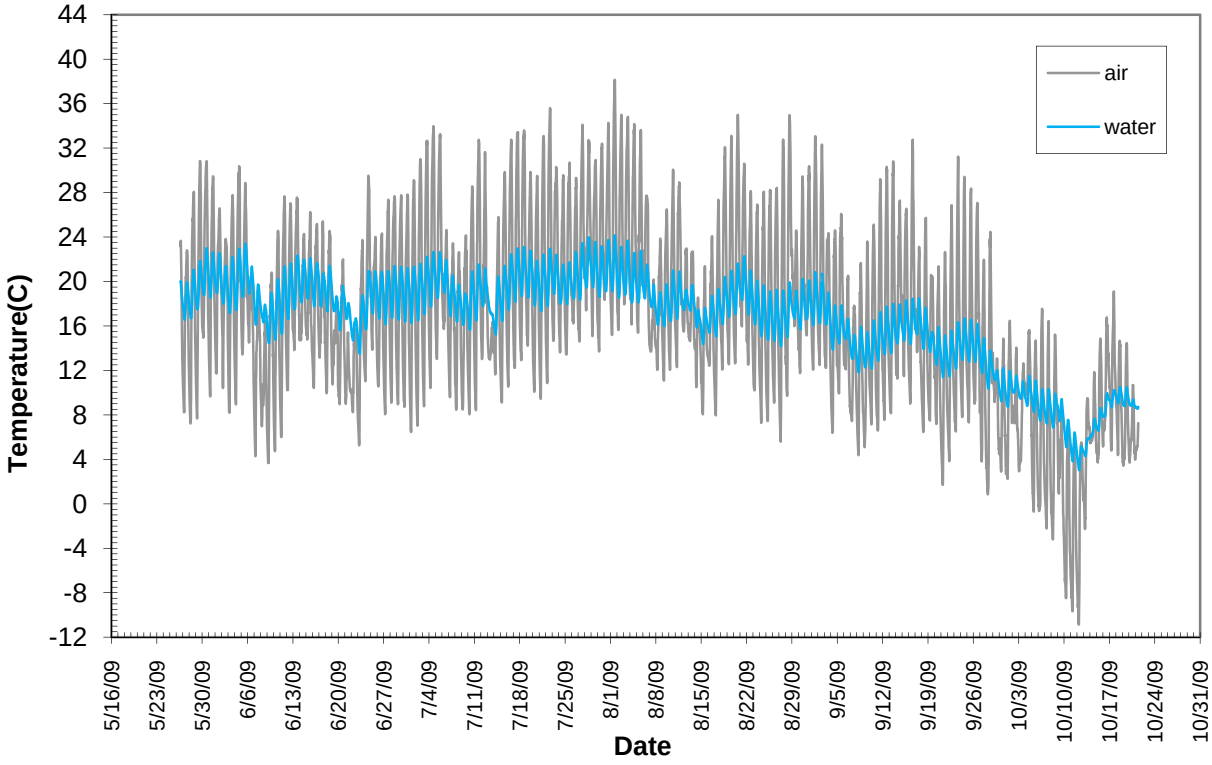


Figure E-21. Hangman Ck. at Chestnut St.



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Appendix F. Streamflow Measurements

Table F-1. Streamflow measurements.

Location	Location_Name	Date	Time	Flow CFS
56HAN-29.3	Hangman Cr. 120' up from Keevey Rd. br.	6/23/2009	12:55:00	17.72
56HAN-29.3	Hangman Cr. 120' up from Keevey Rd. br.	6/23/2009	17:08:00	18.04
56HAN-29.3	Hangman Cr. 120' up from Keevey Rd. br.	7/28/2009	8:20:00	3.72
56HAN-29.3	Hangman Cr. 120' up from Keevey Rd. br.	7/28/2009	13:54:00	2.63
56HAN-04.6	Hangman Cr. below Qualchan GC	6/24/2009	9:24:00	38.59
56HAN-04.6	Hangman Cr. below Qualchan GC	6/24/2009	14:25:00	36.91
56HAN-04.6	Hangman Cr. below Qualchan GC	7/29/2009	9:38:00	14.07
56HAN-04.6	Hangman Cr. below Qualchan GC	7/29/2009	13:51:00	14.46
56HAN-08.9	Hangman Cr. at Yellowstone pipeline	6/24/2009	11:13:00	31.46
56HAN-08.9	Hangman Cr. at Yellowstone pipeline	6/24/2009	11:34:00	32.98
56HAN-08.9	Hangman Cr. at Yellowstone pipeline	6/24/2009	16:26:00	33.43
56HAN-08.9	Hangman Cr. at Yellowstone pipeline	7/29/2009	11:17:00	8.58
56HAN-08.9	Hangman Cr. at Yellowstone pipeline	7/29/2009	15:39:00	9.81
56HAN-12.6	Hangman Cr. below Hangman Hills WWTP	6/24/2009	10:04:00	36.96
56HAN-12.6	Hangman Cr. below Hangman Hills WWTP	6/24/2009	15:25:00	37.11
56HAN-12.6	Hangman Cr. below Hangman Hills WWTP	7/29/2009	10:28:00	10.7
56HAN-12.6	Hangman Cr. below Hangman Hills WWTP	7/29/2009	14:52:00	8.5
56HAN-13.2	Hangman Cr. above Hangman Hills WWTP	6/24/2009	9:10:00	21.12
56HAN-13.2	Hangman Cr. above Hangman Hills WWTP	6/24/2009	14:47:00	32.4
56HAN-13.2	Hangman Cr. above Hangman Hills WWTP	7/29/2009	9:29:00	9.7
56HAN-13.2	Hangman Cr. above Hangman Hills WWTP	7/29/2009	14:03:00	8.03
56HAN-14.5	Hangman Cr. above Hangman Valley GC	6/24/2009	8:25:00	37.49
56HAN-14.5	Hangman Cr. above Hangman Valley GC	6/24/2009	14:00:00	34.1
56HAN-14.5	Hangman Cr. above Hangman Valley GC	7/29/2009	8:21:00	8.51
56HAN-14.5	Hangman Cr. above Hangman Valley GC	7/29/2009	8:45:00	8.49
56HAN-14.5	Hangman Cr. above Hangman Valley GC	7/29/2009	13:23:00	7.78
56HAN-46.3	Hangman Cr. at Spring Valley Rd.	6/22/2009	10:24:00	15.51
56HAN-46.3	Hangman Cr. at Spring Valley Rd.	6/22/2009	14:59:00	15.5
56HAN-46.3	Hangman Cr. at Spring Valley Rd.	7/27/2009	10:55:00	2.89
56HAN-46.3	Hangman Cr. at Spring Valley Rd.	7/27/2009	15:24:00	2.9
56HAN-50.5	Hangman Cr. at Fairbanks Rd.	6/22/2009	13:15:00	11.65
56HAN-50.5	Hangman Cr. at Fairbanks Rd.	6/22/2009	16:53:00	12.87
56HAN-50.5	Hangman Cr. at Fairbanks Rd.	7/27/2009	8:38:00	1.93
56HAN-50.5	Hangman Cr. at Fairbanks Rd.	7/27/2009	13:33:00	2.02
56ROC-12.5	Rock Ck. below WWTP	6/23/2009	10:07:00	2.63
56ROC-12.5	Rock Ck. below WWTP	6/23/2009	14:57:00	2.58
56ROC-12.5	Rock Ck. below WWTP	7/28/2009	14:45:00	7.00E-02
56UNK(LIT08.6)	Unknown drainage at Agency Rd.	1/21/2009	11:38:00	0.26
56UNK(LIT08.6)	Unknown drainage at Agency Rd.	2/18/2009	11:55:00	0.28
56UNK(LIT08.6)	Unknown drainage at Agency Rd.	2/18/2009	12:03:00	0.38
56UNK(LIT08.6)	Unknown drainage at Agency Rd.	3/18/2009	12:16:00	2.97
56ROC-25.9	Rock Ck. at Idaho Rd.	10/29/2008	12:00:00	8.00E-02
56ROC-25.9	Rock Ck. at Idaho Rd.	11/19/2008	12:21:00	0.24
56ROC-25.9	Rock Ck. at Idaho Rd.	1/21/2009	12:43:00	1.87
56ROC-25.9	Rock Ck. at Idaho Rd.	1/21/2009	13:04:00	1.89
56ROC-25.9	Rock Ck. at Idaho Rd.	2/18/2009	12:48:00	1.67
56ROC-25.9	Rock Ck. at Idaho Rd.	2/24/2009	0:00:00	34.1
56ROC-25.9	Rock Ck. at Idaho Rd.	2/24/2009	15:10:00	56.06
56ROC-25.9	Rock Ck. at Idaho Rd.	2/24/2009	15:30:00	60.68
56ROC-25.9	Rock Ck. at Idaho Rd.	3/4/2009	13:17:00	32.34
56ROC-25.9	Rock Ck. at Idaho Rd.	3/17/2009	12:10:00	44.87
56ROC-25.9	Rock Ck. at Idaho Rd.	3/17/2009	12:43:00	42.98
56ROC-25.9	Rock Ck. at Idaho Rd.	4/1/2009	11:42:00	12.91
56ROC-25.9	Rock Ck. at Idaho Rd.	4/14/2009	11:37:00	23.06
56ROC-25.9	Rock Ck. at Idaho Rd.	5/6/2009	13:29:00	4.13

Location	Location_Name	Date	Time	Flow CFS
56ROC-25.9	Rock Ck. at Idaho Rd.	5/6/2009	13:55:00	4.08
56ROC-25.9	Rock Ck. at Idaho Rd.	5/19/2009	11:15:00	1.57
56ROC-25.9	Rock Ck. at Idaho Rd.	6/3/2009	13:32:00	0.2
56ROC-25.9	Rock Ck. at Idaho Rd.	6/16/2009	11:05:00	9.00E-02
56ROC-25.9	Rock Ck. at Idaho Rd.	7/15/2009	13:47:00	6.00E-02
56ROC-25.9	Rock Ck. at Idaho Rd.	8/19/2009	12:12:00	5.00E-02
56ROC-25.9	Rock Ck. at Idaho Rd.	9/16/2009	12:15:00	4.00E-02
56LIT-02.3	Little Hangman Ck. at State Line Rd.	10/29/2008	10:55:00	0.37
56LIT-02.3	Little Hangman Ck. at State Line Rd.	10/29/2008	11:03:00	0.36
56LIT-02.3	Little Hangman Ck. at State Line Rd.	11/19/2008	10:55:00	1
56LIT-02.3	Little Hangman Ck. at State Line Rd.	12/17/2008	10:25:00	0.68
56LIT-02.3	Little Hangman Ck. at State Line Rd.	1/21/2009	10:40:00	19.29
56LIT-02.3	Little Hangman Ck. at State Line Rd.	2/18/2009	11:02:00	14.93
56LIT-02.3	Little Hangman Ck. at State Line Rd.	2/24/2009	12:25:00	418
56LIT-02.3	Little Hangman Ck. at State Line Rd.	3/4/2009	11:00:00	234
56LIT-02.3	Little Hangman Ck. at State Line Rd.	3/16/2009	10:54:00	270.98
56LIT-02.3	Little Hangman Ck. at State Line Rd.	3/18/2009	11:25:00	148
56LIT-02.3	Little Hangman Ck. at State Line Rd.	4/1/2009	9:25:00	96
56LIT-02.3	Little Hangman Ck. at State Line Rd.	4/15/2009	12:54:00	86.62
56LIT-02.3	Little Hangman Ck. at State Line Rd.	4/15/2009	13:36:00	86.53
56LIT-02.3	Little Hangman Ck. at State Line Rd.	5/6/2009	11:12:00	29.88
56LIT-02.3	Little Hangman Ck. at State Line Rd.	5/20/2009	11:57:00	8.77
56LIT-02.3	Little Hangman Ck. at State Line Rd.	6/3/2009	12:35:00	1.47
56LIT-02.3	Little Hangman Ck. at State Line Rd.	6/17/2009	11:37:00	1.1
56LIT-02.3	Little Hangman Ck. at State Line Rd.	6/22/2009	10:58:00	1.57
56LIT-02.3	Little Hangman Ck. at State Line Rd.	6/22/2009	15:22:00	1.5
56LIT-02.3	Little Hangman Ck. at State Line Rd.	7/15/2009	12:20:00	1.22
56LIT-02.3	Little Hangman Ck. at State Line Rd.	7/15/2009	12:40:00	1.21
56LIT-02.3	Little Hangman Ck. at State Line Rd.	7/27/2009	11:20:00	0.31
56LIT-02.3	Little Hangman Ck. at State Line Rd.	7/27/2009	15:34:00	0.34
56LIT-02.3	Little Hangman Ck. at State Line Rd.	8/19/2009	10:47:00	0.24
56LIT-02.3	Little Hangman Ck. at State Line Rd.	9/16/2009	11:29:00	0.22
55BEA-03.7	Bear Ck. at Deer Park - Milan Rd.	10/28/2008	14:25:00	3.16
55BEA-03.7	Bear Ck. at Deer Park - Milan Rd.	11/18/2008	13:30:00	3.25
55BEA-03.7	Bear Ck. at Deer Park - Milan Rd.	1/20/2009	15:30:00	5.77
56CAL-12.2	California Ck. at end of Belmont Rd.	10/29/2008	13:55:00	6.00E-02
56CAL-12.2	California Ck. at end of Belmont Rd.	11/19/2008	16:19:00	0.1
56CAL-12.2	California Ck. at end of Belmont Rd.	2/17/2009	13:09:00	0.1
56CAL-12.2	California Ck. at end of Belmont Rd.	2/25/2009	9:02:00	0.63
56CAL-12.2	California Ck. at end of Belmont Rd.	2/25/2009	14:38:00	0.92
56CAL-12.2	California Ck. at end of Belmont Rd.	3/4/2009	16:39:00	2.41
56CAL-12.2	California Ck. at end of Belmont Rd.	3/4/2009	16:58:00	2.41
56CAL-12.2	California Ck. at end of Belmont Rd.	3/17/2009	15:58:00	0.83
56CAL-12.2	California Ck. at end of Belmont Rd.	4/1/2009	15:48:00	2.27
56CAL-12.2	California Ck. at end of Belmont Rd.	4/14/2009	15:24:00	7.69
56CAL-12.2	California Ck. at end of Belmont Rd.	5/6/2009	17:05:00	3.87
56CAL-12.2	California Ck. at end of Belmont Rd.	5/20/2009	14:38:00	1.7
56CAL-12.2	California Ck. at end of Belmont Rd.	6/3/2009	15:34:00	0.56
56CAL-12.2	California Ck. at end of Belmont Rd.	6/3/2009	15:44:00	0.56
56CAL-12.2	California Ck. at end of Belmont Rd.	6/17/2009	13:10:00	0.34
56CAL-12.2	California Ck. at end of Belmont Rd.	7/15/2009	16:27:00	7.00E-02
56CAL-12.2	California Ck. at end of Belmont Rd.	9/16/2009	14:28:00	0
56CAL-00.1	California Ck. at mouth	2/25/2009	10:25:00	42.42
56CAL-00.1	California Ck. at mouth	2/25/2009	10:59:00	43.18
56CAL-00.1	California Ck. at mouth	2/25/2009	15:40:00	48.76
56CAL-00.1	California Ck. at mouth	6/23/2009	12:02:00	2.13
56CAL-00.1	California Ck. at mouth	6/23/2009	12:34:00	2.25
56CAL-00.1	California Ck. at mouth	6/23/2009	17:25:00	2.04
56CAL-00.1	California Ck. at mouth	7/28/2009	12:47:00	0.7
56CAL-00.1	California Ck. at mouth	7/28/2009	13:02:00	0.59
56CAL-00.1	California Ck. at mouth	7/28/2009	17:02:00	1
56COV-00.2	Cove Ck. at mouth	9/16/2008	11:20:00	8.00E-02

Location	Location_Name	Date	Time	Flow CFS
56COV-00.2	Cove Ck. at mouth	6/22/2009	9:45:00	0.83
56COV-00.2	Cove Ck. at mouth	6/22/2009	14:28:00	0.66
56COV-00.2	Cove Ck. at mouth	7/27/2009	10:08:00	0.2
56COV-00.2	Cove Ck. at mouth	7/27/2009	14:47:00	0.26
56FREWTP	Freeman School District WWTP	12/17/2008	15:03:00	0.02
56FREWTP	Freeman School District WWTP	2/18/2009	16:00:00	0.02
56FREWTP	Freeman School District WWTP	3/17/2009	11:04:00	3.00E-02
56FREWTP	Freeman School District WWTP	3/18/2009	14:38:00	6.00E-02
56FREWTP	Freeman School District WWTP	4/14/2009	10:09:00	0.02
56FREWTP	Freeman School District WWTP	4/15/2009	16:50:00	0.01
56HAN-55.8	Hangman Ck. above Tekoa	9/16/2008	8:58:00	0.44
56HAN-55.8	Hangman Ck. above Tekoa	9/16/2008	9:10:00	0.43
56HAN-55.8	Hangman Ck. above Tekoa	6/22/2009	10:15:00	10.44
56HAN-55.8	Hangman Ck. above Tekoa	6/22/2009	14:44:00	9.28
56HAN-55.8	Hangman Ck. above Tekoa	7/27/2009	10:25:00	1.46
56HAN-55.8	Hangman Ck. above Tekoa	7/27/2009	14:45:00	1.38
56HAN-07.8	Hangman Ck. at Campion Park	9/17/2008	12:28:00	4.22
56HAN-19.1	Hangman Ck. at Duncan	6/23/2009	11:17:00	27.63
56HAN-19.1	Hangman Ck. at Duncan	7/28/2009	11:54:00	6.86
56HAN-19.1	Hangman Ck. at Duncan	7/28/2009	12:13:00	6.49
56HAN-19.1	Hangman Ck. at Duncan	7/28/2009	16:29:00	7.08
56HAN-03.6	Hangman Ck. at Kampa Bridge	6/24/2009	10:32:00	44.81
56HAN-03.6	Hangman Ck. at Kampa Bridge	6/24/2009	15:37:00	42.74
56HAN-03.6	Hangman Ck. at Kampa Bridge	7/29/2009	10:37:00	18.02
56HAN-03.6	Hangman Ck. at Kampa Bridge	7/29/2009	14:50:00	18.59
56HAN-21.8	Hangman Ck. at Latah Ck. Rd.	9/17/2008	9:51:00	2.45
56HAN-21.8	Hangman Ck. at Latah Ck. Rd.	9/17/2008	10:06:00	2.7
56HAN-21.8	Hangman Ck. at Latah Ck. Rd.	6/23/2009	8:43:00	19.75
56HAN-21.8	Hangman Ck. at Latah Ck. Rd.	6/23/2009	14:12:00	18.92
56HAN-21.8	Hangman Ck. at Latah Ck. Rd.	6/23/2009	14:36:00	19.21
56HAN-21.8	Hangman Ck. at Latah Ck. Rd.	7/28/2009	10:12:00	5.62
56HAN-21.8	Hangman Ck. at Latah Ck. Rd.	7/28/2009	15:15:00	4.66
56HAN-47.0	Hangman Ck. at Marsh Rd.	6/22/2009	8:54:00	13.03
56HAN-47.0	Hangman Ck. at Marsh Rd.	6/22/2009	14:01:00	11.67
56HAN-47.0	Hangman Ck. at Marsh Rd.	7/27/2009	9:28:00	2.55
56HAN-47.0	Hangman Ck. at Marsh Rd.	7/27/2009	14:14:00	2.53
56HAN-06.2	Hangman Ck. at Qualchan GC	6/24/2009	12:32:00	40.76
56HAN-06.2	Hangman Ck. at Qualchan GC	6/24/2009	17:15:00	39.37
56HAN-06.2	Hangman Ck. at Qualchan GC	7/29/2009	12:11:00	8.06
56HAN-06.2	Hangman Ck. at Qualchan GC	7/29/2009	16:27:00	11.96
56HAN-41.2	Hangman Ck. at Roberts Rd.	9/16/2008	11:54:00	1.24
56HAN-41.2	Hangman Ck. at Roberts Rd.	6/22/2009	11:28:00	16.86
56HAN-41.2	Hangman Ck. at Roberts Rd.	6/22/2009	11:50:00	16.88
56HAN-41.2	Hangman Ck. at Roberts Rd.	6/22/2009	15:47:00	16.14
56HAN-41.2	Hangman Ck. at Roberts Rd.	7/27/2009	11:50:00	3.42
56HAN-41.2	Hangman Ck. at Roberts Rd.	7/27/2009	12:12:00	3.16
56HAN-41.2	Hangman Ck. at Roberts Rd.	7/27/2009	16:10:00	3.31
56HAN-57.7	Hangman Ck. at state line	10/29/2008	10:16:00	0.72
56HAN-57.7	Hangman Ck. at state line	11/19/2008	10:03:00	5.56
56HAN-57.7	Hangman Ck. at state line	12/17/2008	9:41:00	4.65
56HAN-57.7	Hangman Ck. at state line	2/18/2009	9:30:00	45.23
56HAN-57.7	Hangman Ck. at state line	6/3/2009	11:43:00	13.67
56HAN-57.7	Hangman Ck. at state line	6/17/2009	10:50:00	7.86
56HAN-57.7	Hangman Ck. at state line	6/22/2009	9:05:00	8.67
56HAN-57.7	Hangman Ck. at state line	6/22/2009	9:26:00	9.39
56HAN-57.7	Hangman Ck. at state line	6/22/2009	14:06:00	8.42
56HAN-57.7	Hangman Ck. at state line	7/15/2009	10:40:00	7.39
56HAN-57.7	Hangman Ck. at state line	7/27/2009	8:51:00	1.3
56HAN-57.7	Hangman Ck. at state line	7/27/2009	9:21:00	1.35
56HAN-57.7	Hangman Ck. at state line	7/27/2009	13:51:00	1.14
56HAN-57.7	Hangman Ck. at state line	8/19/2009	9:55:00	0.97

Location	Location_Name	Date	Time	Flow CFS
56HAN-57.7	Hangman Ck. at state line	8/19/2009	10:11:00	0.85
56HAN-57.7	Hangman Ck. at state line	9/16/2009	10:45:00	0.4
56HAN-54.3	Hangman Ck. below Tekoa	9/16/2008	10:46:00	0.88
56HAN-54.3	Hangman Ck. below Tekoa	6/22/2009	12:31:00	12.88
56HAN-54.3	Hangman Ck. below Tekoa	6/22/2009	16:19:00	12.54
56HAN-54.3	Hangman Ck. below Tekoa	7/27/2009	12:59:00	2.14
56HAN-54.3	Hangman Ck. below Tekoa	7/27/2009	16:50:00	1.76
56A200	Hangman Creek at Bradshaw Rd.	6/23/2009	12:03:00	16.84
56A200	Hangman Creek at Bradshaw Rd.	6/23/2009	16:31:00	18.1
56A200	Hangman Creek at Bradshaw Rd.	7/28/2009	11:52:00	3.46
56A200	Hangman Creek at Bradshaw Rd.	7/28/2009	16:25:00	3.32
56HAN-01.9	Hangman Creek at Chestnut St.	6/24/2009	11:21:00	52.13
56HAN-01.9	Hangman Creek at Chestnut St.	6/24/2009	16:20:00	48.86
56HAN-01.9	Hangman Creek at Chestnut St.	7/29/2009	11:16:00	22.32
56HAN-01.9	Hangman Creek at Chestnut St.	7/29/2009	15:43:00	24.04
56HAN-01.9	Hangman Creek at Chestnut St.	7/29/2009	16:14:00	23.79
56LIT-00.0	Little Hangman Ck. at mouth	9/16/2008	9:41:00	7.00E-02
56LIT-00.0	Little Hangman Ck. at mouth	6/22/2009	11:40:00	1.66
56LIT-00.0	Little Hangman Ck. at mouth	6/22/2009	15:49:00	1.69
56LIT-00.0	Little Hangman Ck. at mouth	7/27/2009	12:00:00	0.49
56LIT-00.0	Little Hangman Ck. at mouth	7/27/2009	16:13:00	0.42
56MAR-05.3	Marshall Ck. at McKenzie Rd.	9/17/2008	11:37:00	7.18
56MAR-05.3	Marshall Ck. at McKenzie Rd.	6/24/2009	7:39:00	7.96
56MAR-05.3	Marshall Ck. at McKenzie Rd.	6/24/2009	7:58:00	7.99
56MAR-05.3	Marshall Ck. at McKenzie Rd.	6/24/2009	13:04:00	7.33
56MAR-05.3	Marshall Ck. at McKenzie Rd.	7/29/2009	8:04:00	7.37
56MAR-05.3	Marshall Ck. at McKenzie Rd.	7/29/2009	12:40:00	7.02
56MAR-00.0	Marshall Ck. at mouth	9/17/2008	12:04:00	2.56
56MAR-00.0	Marshall Ck. at mouth	2/25/2009	10:20:00	4.71
56MAR-00.0	Marshall Ck. at mouth	2/25/2009	17:00:00	4.65
56MAR-00.0	Marshall Ck. at mouth	6/24/2009	8:40:00	5.53
56MAR-00.0	Marshall Ck. at mouth	6/24/2009	13:52:00	5.2
56MAR-00.0	Marshall Ck. at mouth	7/29/2009	9:04:00	4.43
56MAR-00.0	Marshall Ck. at mouth	7/29/2009	13:20:00	4.26
56NFR-03.8	N. Fork Rock Ck. at state line	10/29/2008	12:59:00	0.33
56NFR-03.8	N. Fork Rock Ck. at state line	11/19/2008	15:16:00	0.32
56NFR-03.8	N. Fork Rock Ck. at state line	12/17/2008	13:36:00	9.00E-02
56NFR-03.8	N. Fork Rock Ck. at state line	12/17/2008	13:45:00	0.12
56NFR-03.8	N. Fork Rock Ck. at state line	1/21/2009	15:42:00	8.35
56NFR-03.8	N. Fork Rock Ck. at state line	2/18/2009	15:10:00	4.99
56NFR-03.8	N. Fork Rock Ck. at state line	2/24/2009	12:49:00	112
56NFR-03.8	N. Fork Rock Ck. at state line	2/24/2009	16:33:00	131
56NFR-03.8	N. Fork Rock Ck. at state line	3/4/2009	15:45:00	129
56NFR-03.8	N. Fork Rock Ck. at state line	3/16/2009	14:06:00	145.73
56NFR-03.8	N. Fork Rock Ck. at state line	3/17/2009	0:00:00	87
56NFR-03.8	N. Fork Rock Ck. at state line	4/1/2009	14:15:00	50.09
56NFR-03.8	N. Fork Rock Ck. at state line	4/14/2009	14:00:00	65.9
56NFR-03.8	N. Fork Rock Ck. at state line	5/6/2009	15:43:00	10.19
56NFR-03.8	N. Fork Rock Ck. at state line	5/19/2009	12:55:00	3.13
56NFR-03.8	N. Fork Rock Ck. at state line	5/19/2009	13:20:00	3.15
56NFR-03.8	N. Fork Rock Ck. at state line	6/3/2009	14:39:00	0.33
56NFR-03.8	N. Fork Rock Ck. at state line	6/16/2009	12:36:00	0.11
56NFR-03.8	N. Fork Rock Ck. at state line	7/15/2009	15:20:00	0.27
56NFR-03.8	N. Fork Rock Ck. at state line	8/19/2009	13:28:00	0.17
56NFR-03.8	N. Fork Rock Ck. at state line	9/16/2009	13:23:00	4.00E-02
56NFR-03.8	N. Fork Rock Ck. at state line	9/16/2009	13:32:00	3.00E-02
34PHI-01.6	Phillips Ck. at Cheney - Spangle Rd.	1/20/2009	9:30:00	0
34PHI-01.6	Phillips Ck. at Cheney - Spangle Rd.	2/25/2009	0:00:00	0
34PHI-01.6	Phillips Ck. at Cheney - Spangle Rd.	3/4/2009	8:25:00	2.31
34PHI-01.6	Phillips Ck. at Cheney - Spangle Rd.	3/18/2009	8:06:00	1.74
34PHI-01.6	Phillips Ck. at Cheney - Spangle Rd.	3/31/2009	13:25:00	5.33

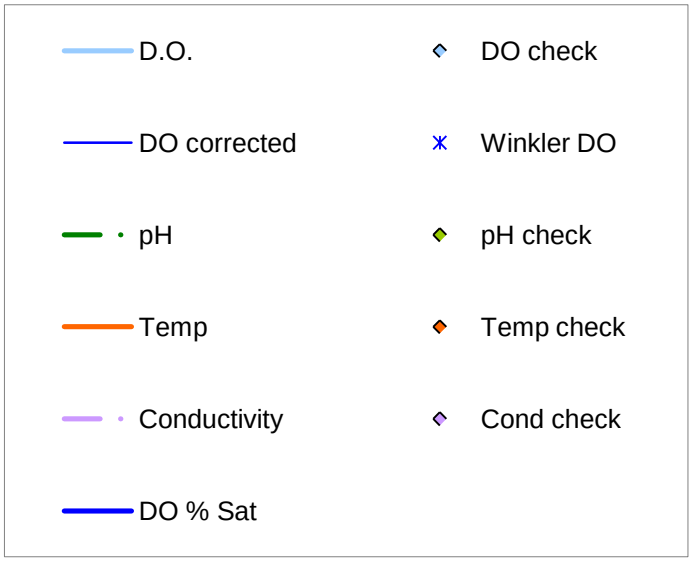
Location	Location_Name	Date	Time	Flow CFS
34PHI-01.6	Phillips Ck. at Cheney - Spangle Rd.	4/15/2009	9:17:00	4.21
34PHI-01.6	Phillips Ck. at Cheney - Spangle Rd.	5/5/2009	14:50:00	1.87
34PHI-01.6	Phillips Ck. at Cheney - Spangle Rd.	5/20/2009	9:58:00	1.11
34PHI-01.6	Phillips Ck. at Cheney - Spangle Rd.	6/2/2009	14:10:00	0.22
34PHI-01.6	Phillips Ck. at Cheney - Spangle Rd.	6/17/2009	8:50:00	0
56RAT-05.7	Rattler Run at Fairfield above WWTP	6/22/2009	12:40:00	0.02
56RAT-05.7	Rattler Run at Fairfield above WWTP	6/22/2009	16:32:00	0.02
56RAT-05.7	Rattler Run at Fairfield above WWTP	7/27/2009	12:59:00	0.01
56RAT-05.7	Rattler Run at Fairfield above WWTP	7/27/2009	16:50:00	0
56RAT-00.1	Rattler Run at mouth	2/25/2009	13:45:00	32.72
56RAT-00.1	Rattler Run at mouth	6/22/2009	13:22:00	0.74
56RAT-00.1	Rattler Run at mouth	6/22/2009	16:57:00	0.65
56RAT-00.1	Rattler Run at mouth	7/28/2009	12:34:00	0.12
56RAT-00.1	Rattler Run at mouth	7/28/2009	17:00:00	0.1
56ROC-08.9	Rock Ck. at Jackson Rd.	9/17/2008	9:00:00	4.00E-02
56ROC-08.9	Rock Ck. at Jackson Rd.	6/23/2009	10:55:00	3.59
56ROC-08.9	Rock Ck. at Jackson Rd.	6/23/2009	15:40:00	3.84
56ROC-08.9	Rock Ck. at Jackson Rd.	7/28/2009	10:29:00	0.24
56ROC-08.9	Rock Ck. at Jackson Rd.	7/28/2009	15:30:00	0.26
56ROC-00.5	Rock Ck. at mouth	6/23/2009	9:45:00	7.08
56ROC-00.5	Rock Ck. at mouth	6/23/2009	15:24:00	6.65
56ROC-00.5	Rock Ck. at mouth	7/28/2009	10:59:00	1.57
56ROC-00.5	Rock Ck. at mouth	7/28/2009	15:54:00	1.33
56ROC-13.7	Rock Ck. at Rockford	9/17/2008	7:56:00	8.00E-02
56ROC-13.7	Rock Ck. at Rockford	6/23/2009	9:25:00	2.11
56ROC-13.7	Rock Ck. at Rockford	6/23/2009	14:17:00	2.31
56ROC-13.7	Rock Ck. at Rockford	7/28/2009	8:45:00	0.32
56ROC-13.7	Rock Ck. at Rockford	7/28/2009	14:05:00	0.17
56ROC-15.4	Rock Ck. below N Fork confluence	6/23/2009	8:37:00	2.41
56ROC-15.4	Rock Ck. below N Fork confluence	6/23/2009	8:50:00	2.24
56ROC-15.4	Rock Ck. below N Fork confluence	6/23/2009	13:55:00	2.56
56ROC-15.4	Rock Ck. below N Fork confluence	7/28/2009	7:50:00	0.3
56ROC-15.4	Rock Ck. below N Fork confluence	7/28/2009	8:03:00	0.31
56ROC-15.4	Rock Ck. below N Fork confluence	7/28/2009	13:27:00	0.28
56ROS-01.7	Rose Ck. at state line	10/29/2008	12:30:00	0.23
56ROS-01.7	Rose Ck. at state line	11/19/2008	13:59:00	0.47
56ROS-01.7	Rose Ck. at state line	11/19/2008	14:17:00	0.5
56ROS-01.7	Rose Ck. at state line	12/17/2008	13:10:00	0.13
56ROS-01.7	Rose Ck. at state line	1/21/2009	15:00:00	3.45
56ROS-01.7	Rose Ck. at state line	2/18/2009	14:33:00	3.28
56ROS-01.7	Rose Ck. at state line	2/24/2009	15:50:00	92
56ROS-01.7	Rose Ck. at state line	3/4/2009	14:43:00	52.85
56ROS-01.7	Rose Ck. at state line	3/17/2009	13:58:00	61.61
56ROS-01.7	Rose Ck. at state line	4/1/2009	12:43:00	20.22
56ROS-01.7	Rose Ck. at state line	4/1/2009	13:11:00	19.32
56ROS-01.7	Rose Ck. at state line	4/14/2009	12:50:00	31.95
56ROS-01.7	Rose Ck. at state line	5/6/2009	14:54:00	6.08
56ROS-01.7	Rose Ck. at state line	5/19/2009	12:16:00	2.31
56ROS-01.7	Rose Ck. at state line	6/3/2009	14:09:00	0.48
56ROS-01.7	Rose Ck. at state line	6/16/2009	11:50:00	0.43
56ROS-01.7	Rose Ck. at state line	6/16/2009	12:01:00	0.44
56ROS-01.7	Rose Ck. at state line	7/15/2009	14:37:00	0.22
56ROS-01.7	Rose Ck. at state line	8/19/2009	12:55:00	0.18
56ROS-01.7	Rose Ck. at state line	9/16/2009	12:50:00	0.12
56SPA-00.0	Spangle Ck. at mouth	2/25/2009	12:34:00	25.5
56SPA-00.0	Spangle Ck. at mouth	2/25/2009	15:45:00	29
56SPA-00.0	Spangle Ck. at mouth	6/23/2009	10:30:00	0.87
56SPA-00.0	Spangle Ck. at mouth	6/23/2009	16:20:00	0.68
56SPA-00.0	Spangle Ck. at mouth	7/28/2009	0:00:00	0
56SPA-05.2	Spangle Ck. below WWTP	6/23/2009	7:51:00	0.95
56SPA-05.2	Spangle Ck. below WWTP	6/23/2009	13:21:00	1.05

Location	Location_Name	Date	Time	Flow CFS
56SPA-05.2	Spangle Ck. below WWTP	7/28/2009	9:23:00	0.15
56SPA-05.2	Spangle Ck. below WWTP	7/28/2009	14:43:00	9.00E-02
56STE-00.0	Stevens Ck. at mouth	6/24/2009	8:00:00	0.88
56STE-00.0	Stevens Ck. at mouth	6/24/2009	13:35:00	0.72
56STE-00.0	Stevens Ck. at mouth	7/29/2009	7:58:00	4.00E-02
56STE-00.0	Stevens Ck. at mouth	7/29/2009	13:03:00	6.00E-02
56Unk(LIT-08.6)	Unknown drainage at Agency Rd.	2/24/2009	16:14:00	16.18
56Unk(LIT-08.6)	Unknown drainage at Agency Rd.	3/4/2009	12:00:00	6.43
56Unk(LIT-08.6)	Unknown drainage at Agency Rd.	4/1/2009	10:20:00	1.78
56Unk(LIT-08.6)	Unknown drainage at Agency Rd.	4/15/2009	14:36:00	2.13
56Unk(LIT-08.6)	Unknown drainage at Agency Rd.	5/6/2009	12:17:00	0.53
56Unk(LIT-08.6)	Unknown drainage at Agency Rd.	5/20/2009	12:56:00	0.23
56Unk(LIT-08.6)	Unknown drainage at Agency Rd.	6/3/2009	12:59:00	0
56Unk(LIT-08.6)	Unknown drainage at Agency Rd.	6/17/2009	12:05:00	0

GC: Golf Course
WWTP: Wastewater Treatment Plant

Appendix G. Hydrolab deployment plots

Legend for Appendix G figures



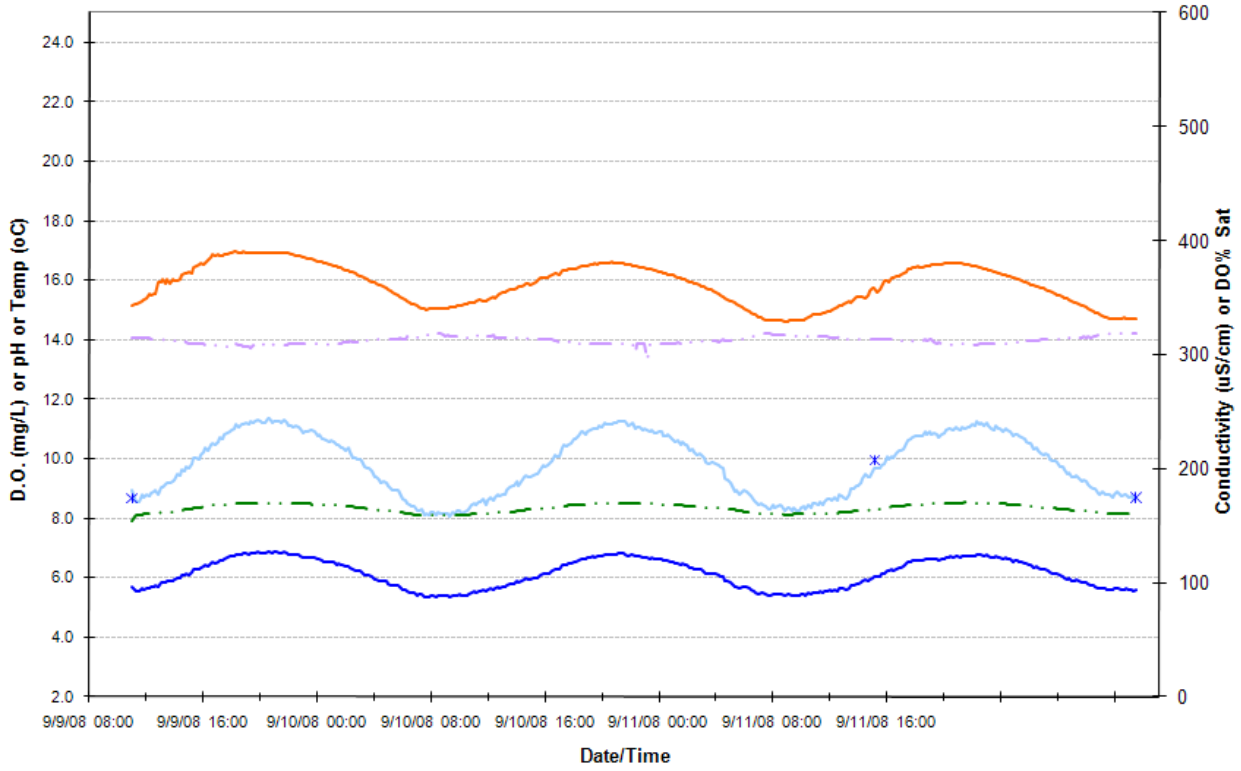


Figure G-1. Hangman Creek @ Hangman Valley Golf Course.

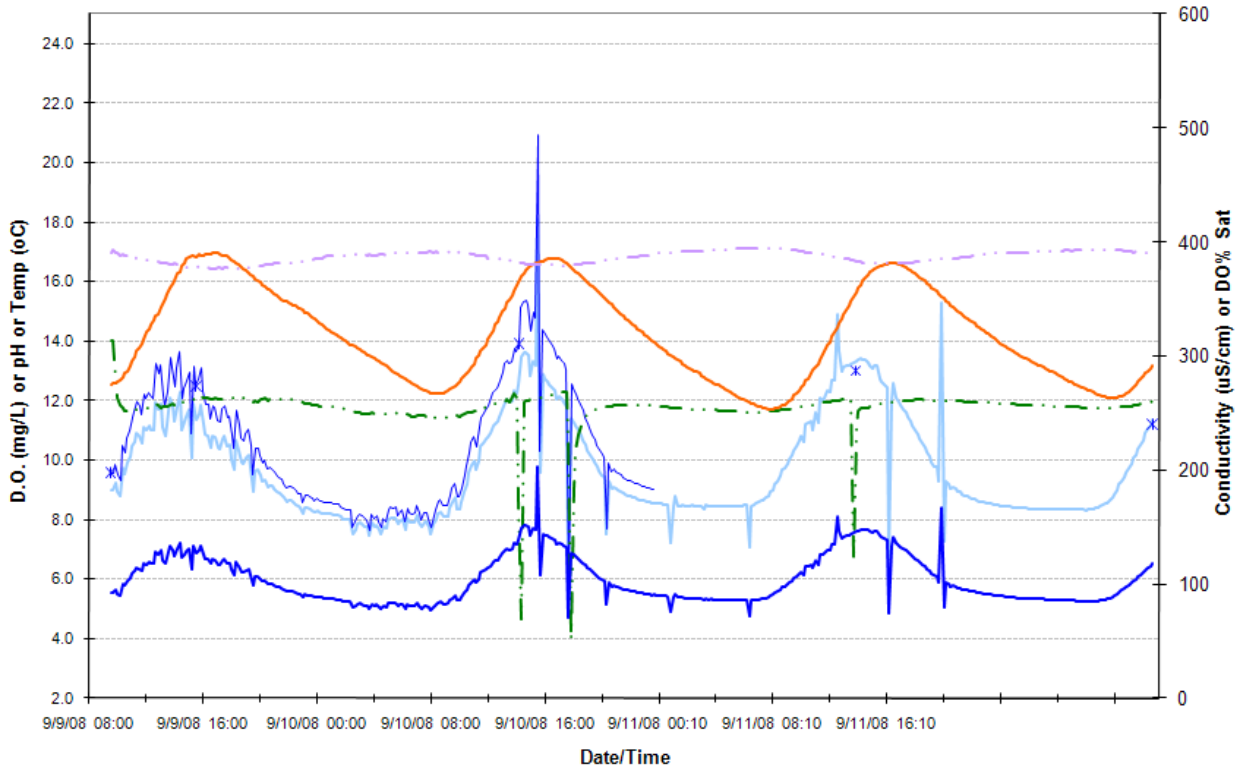


Figure G-2. Hangman @ Chestnut St.

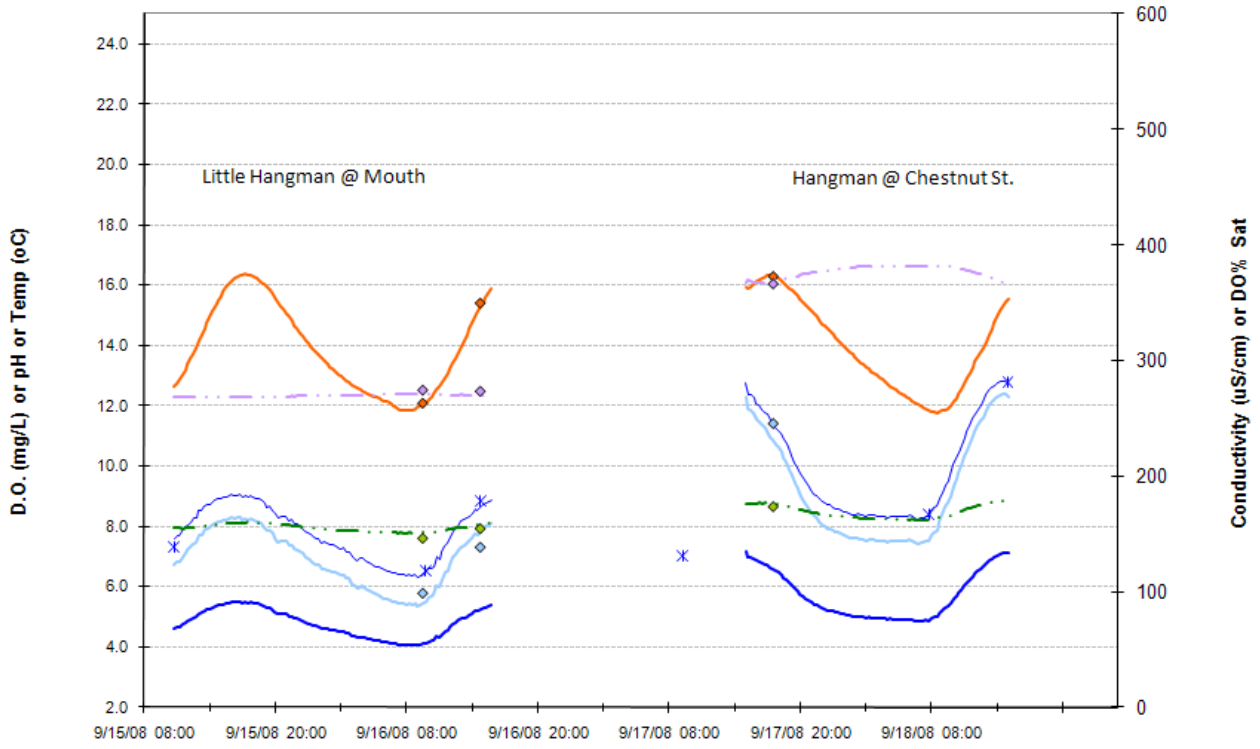


Figure G-3. Little Hangman @ Mouth and Hangman @ Chestnut St.

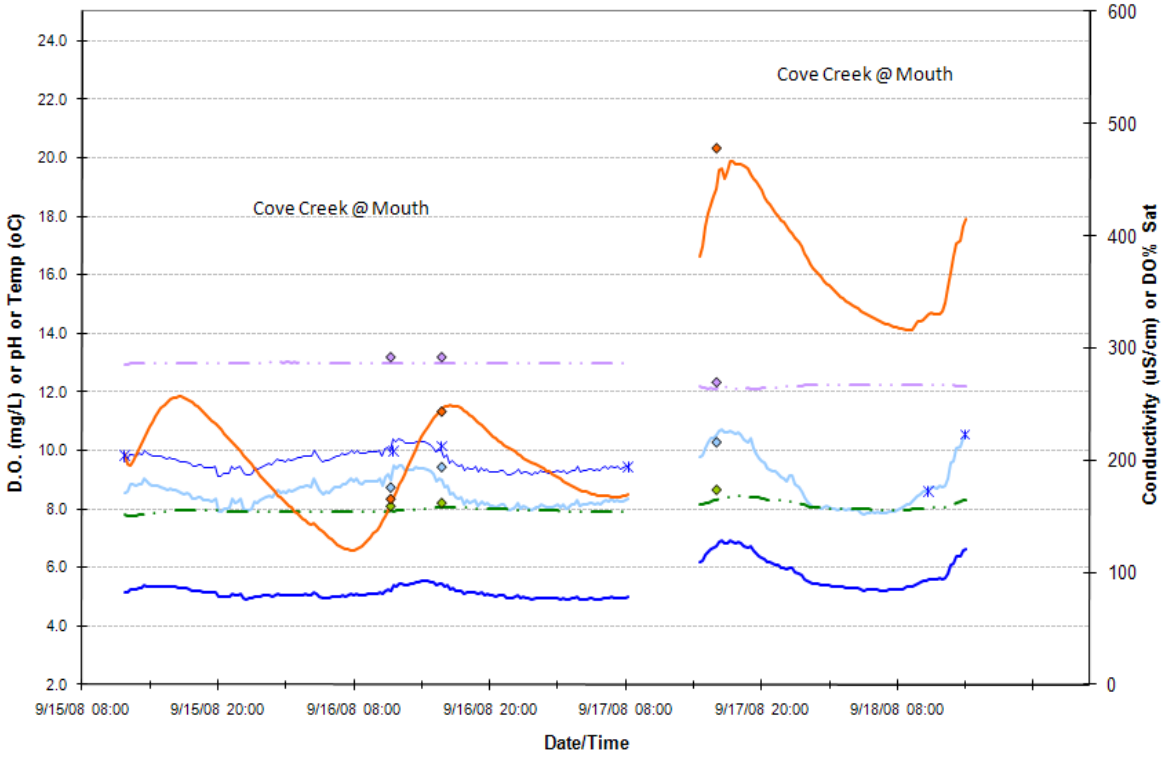


Figure G-4. Cove Creek @ Mouth and Hangman @ Duncan.

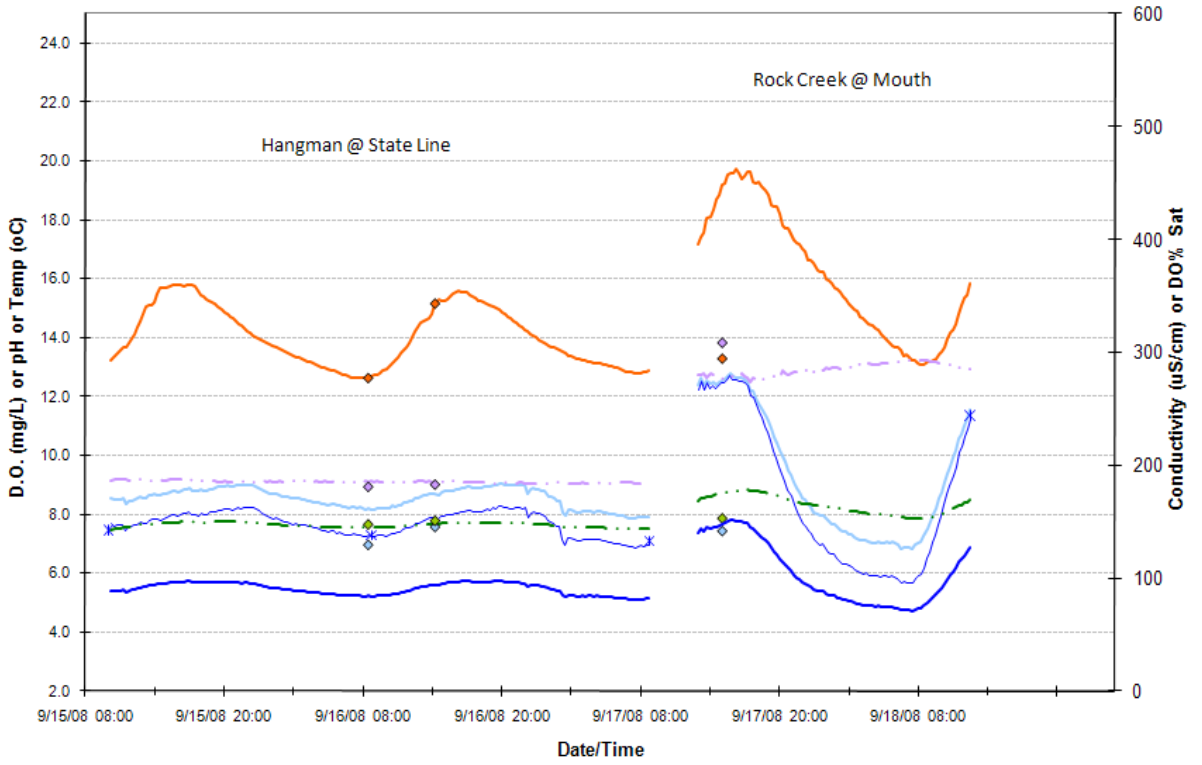


Figure G-5. Hangman @ State Line and Rock Creek @ Mouth.

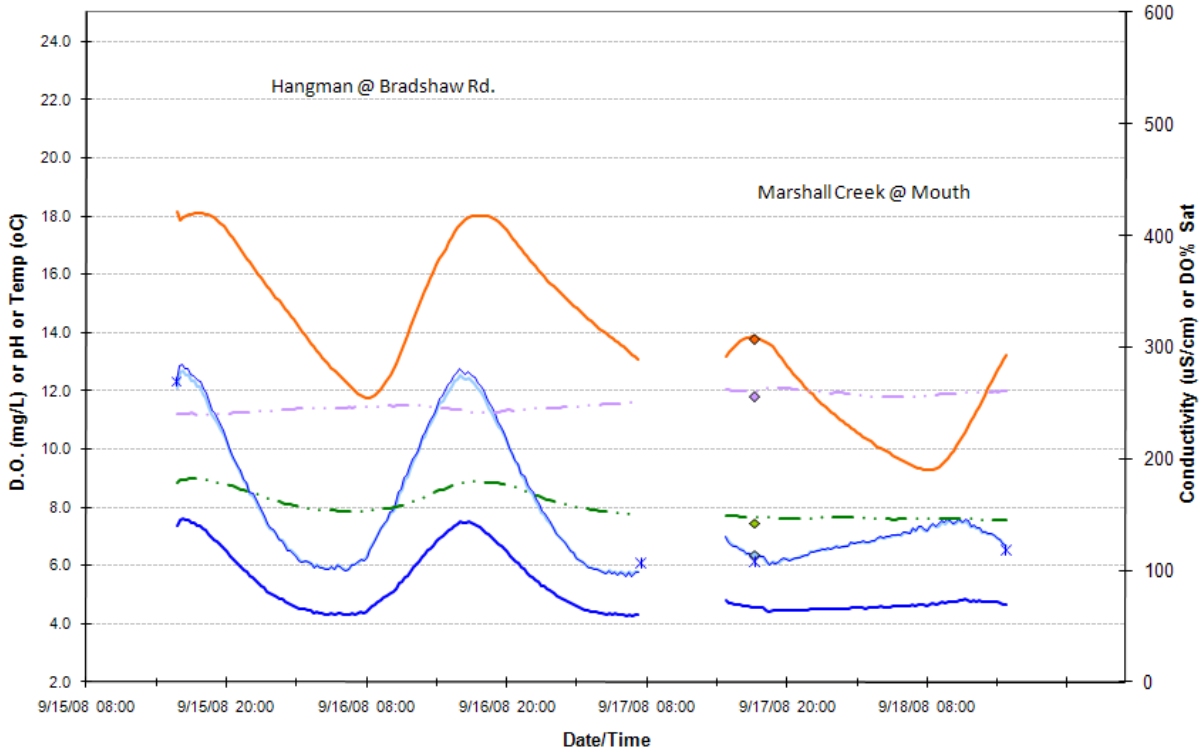


Figure G-6. Hangman @ Bradshaw Rd and Marshall Creek @ Mouth

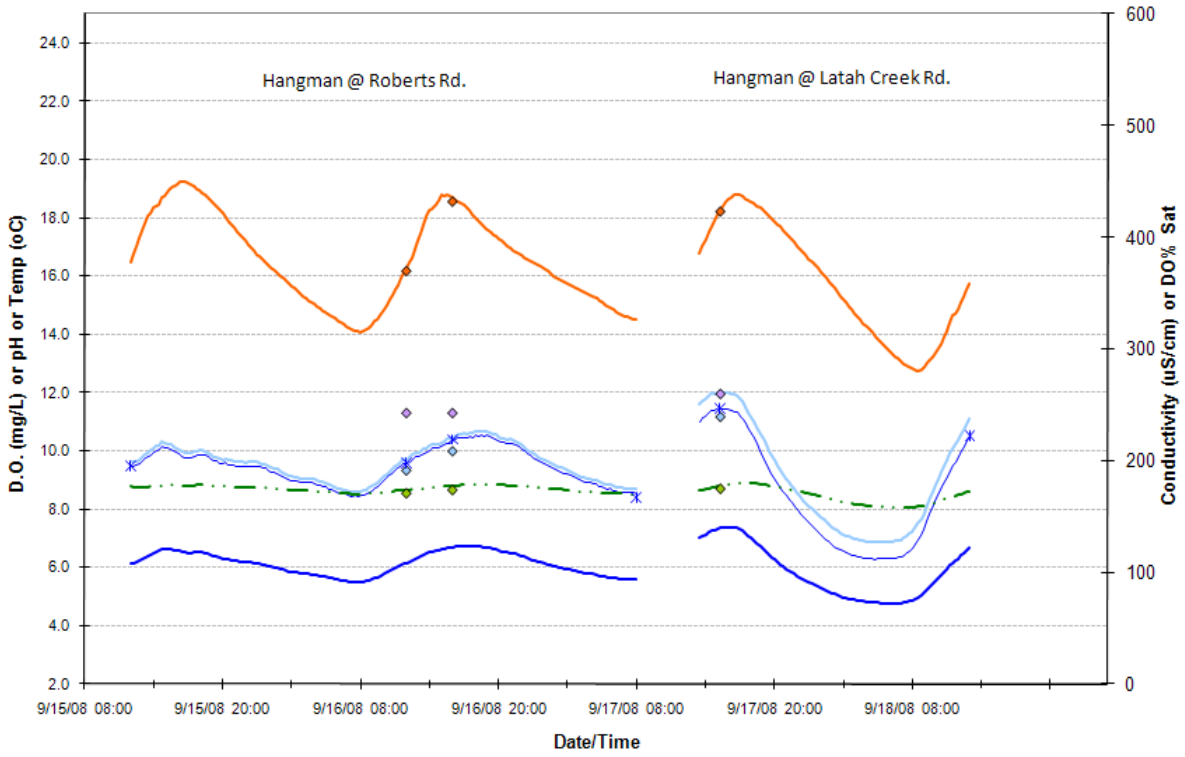


Figure G-7. Hangman @ Roberts Rd and Hangman @ Latah Creek Rd.

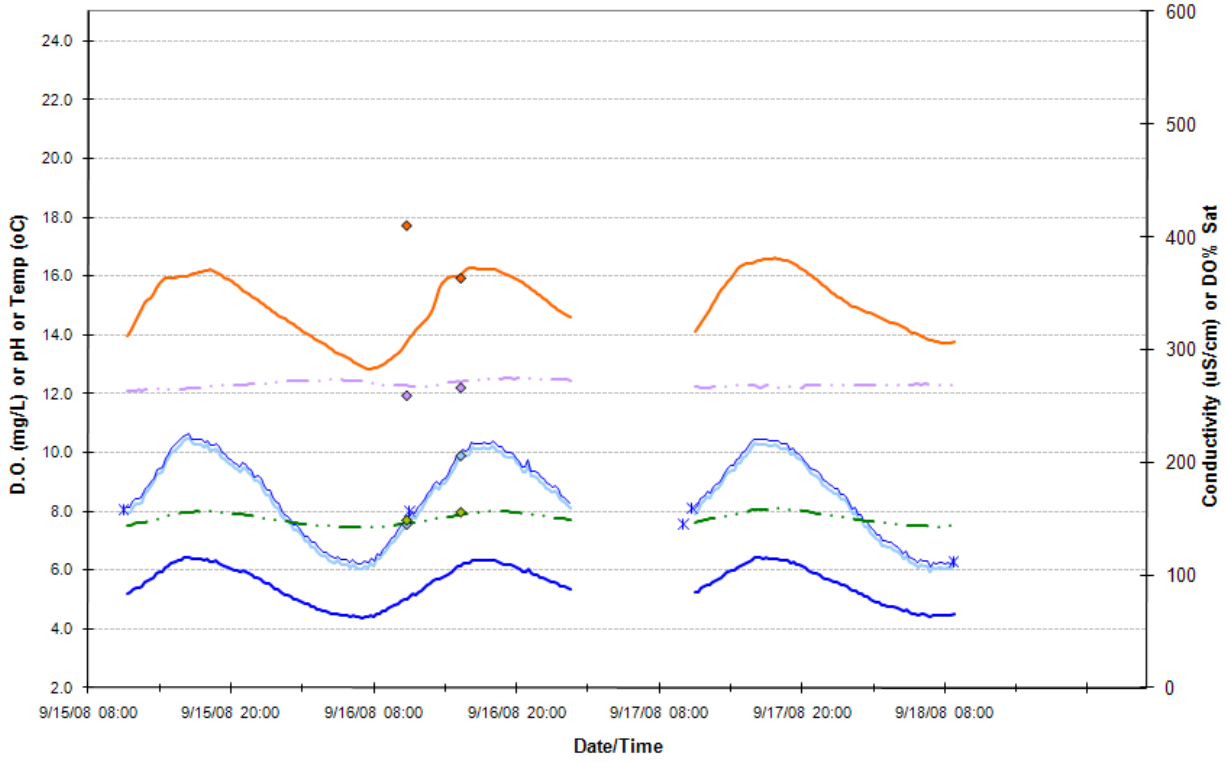


Figure G-8. Hangman below Tekoa.

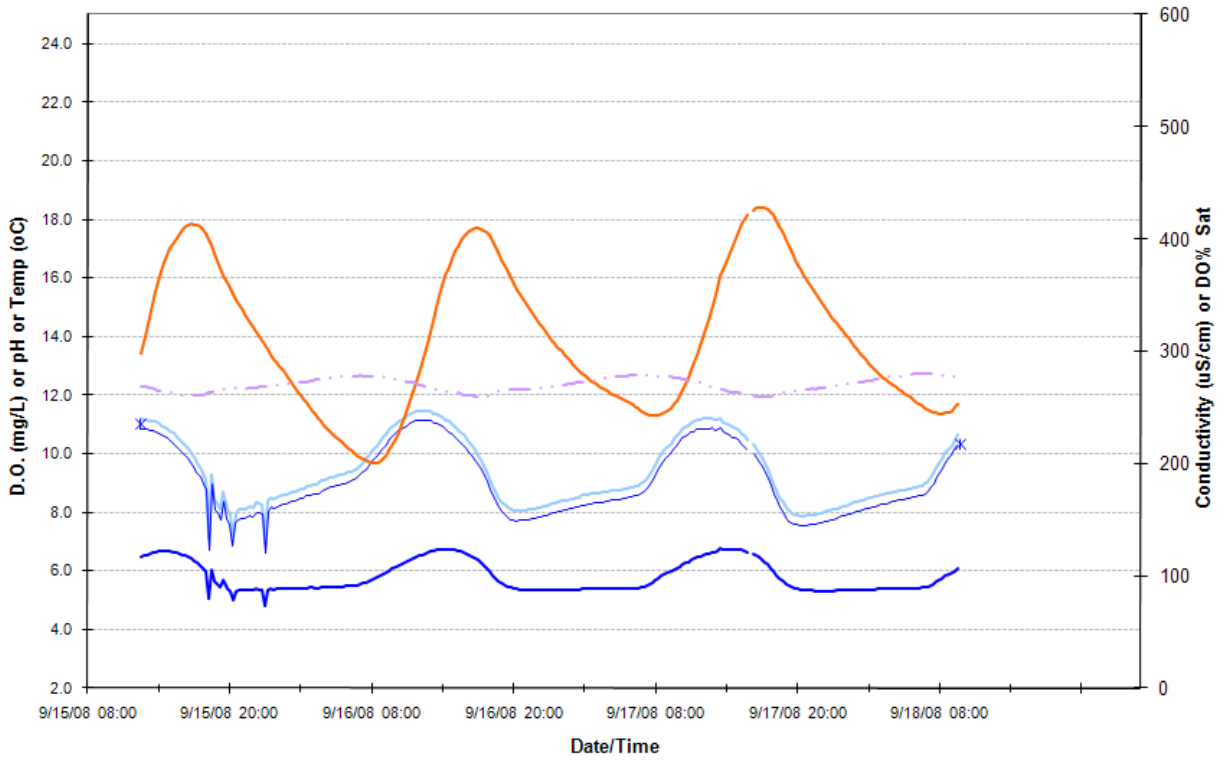


Figure G-9. Hangman @ Keevey Rd.

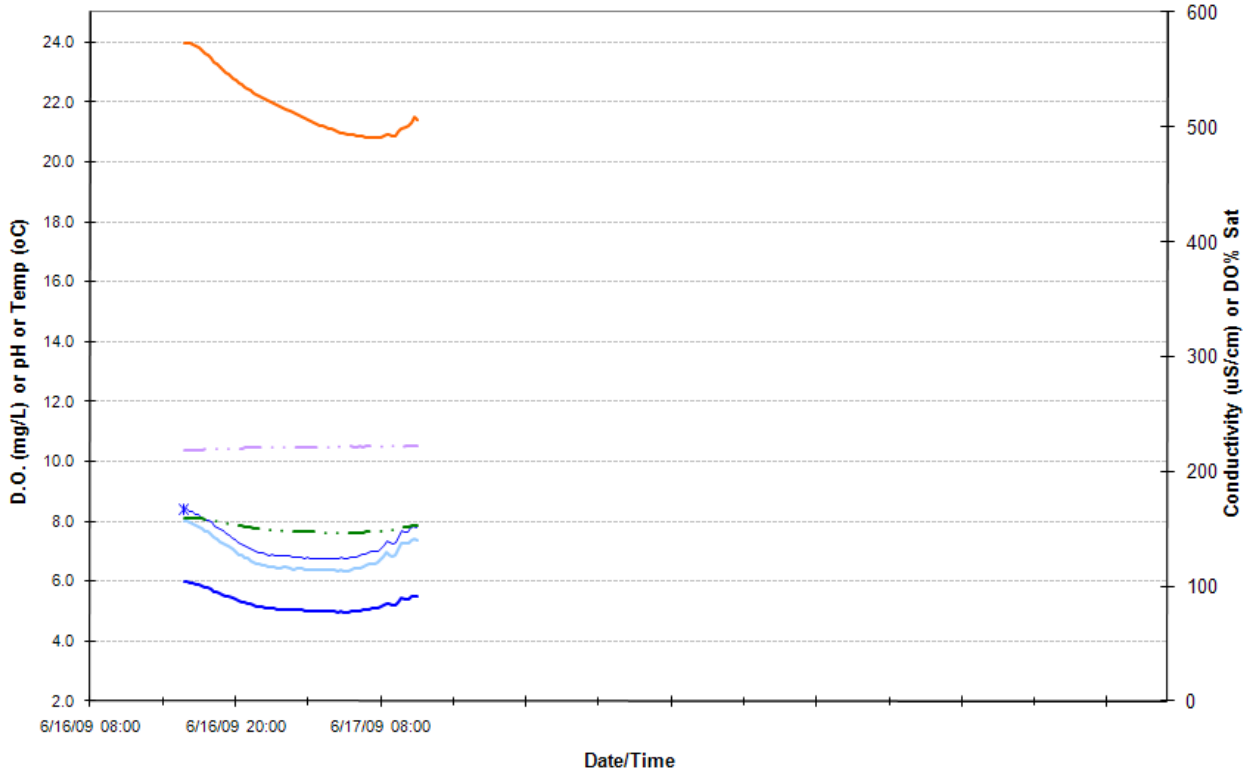


Figure G-10. Hangman @ Duncan.

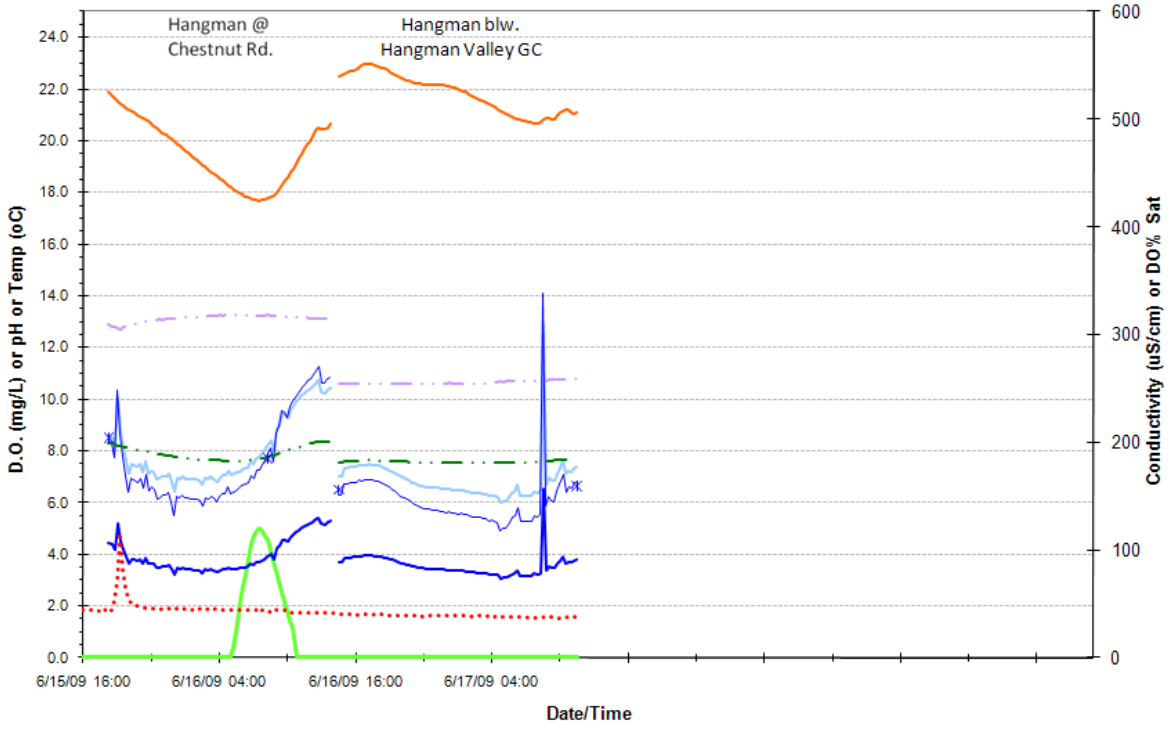


Figure G-11. Hangman @ Chestnut St. and Hangman below Hangman Valley Golf Course.

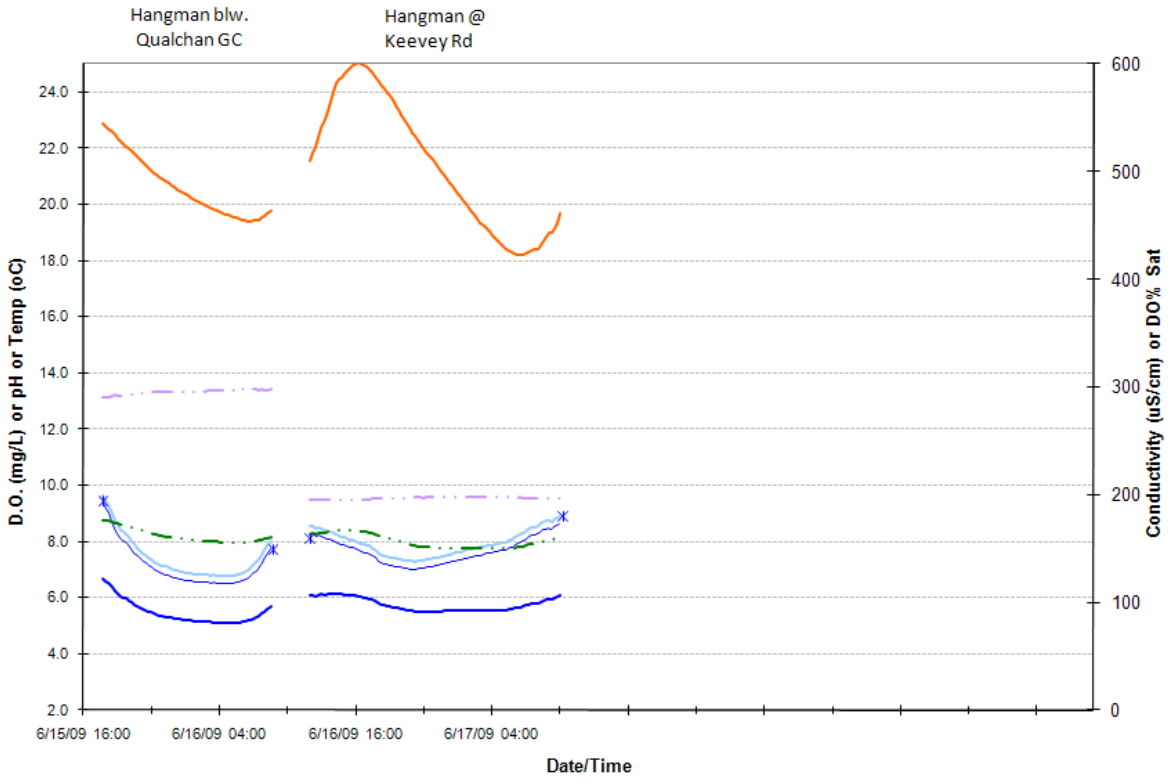


Figure G-12. Hangman below Qualchan Golf Course and Hangman @ Keevey Rd.

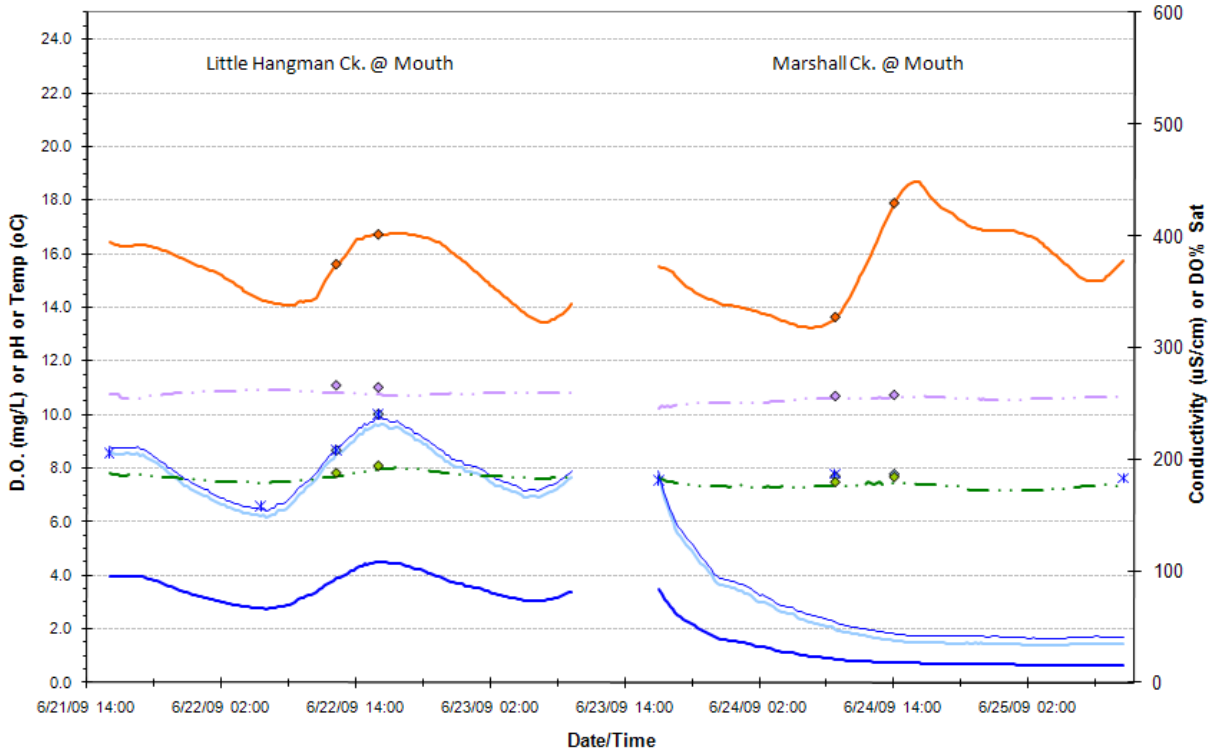


Figure G-13. Little Hangman Creek @ Mouth and Marshall Creek @ Mouth.

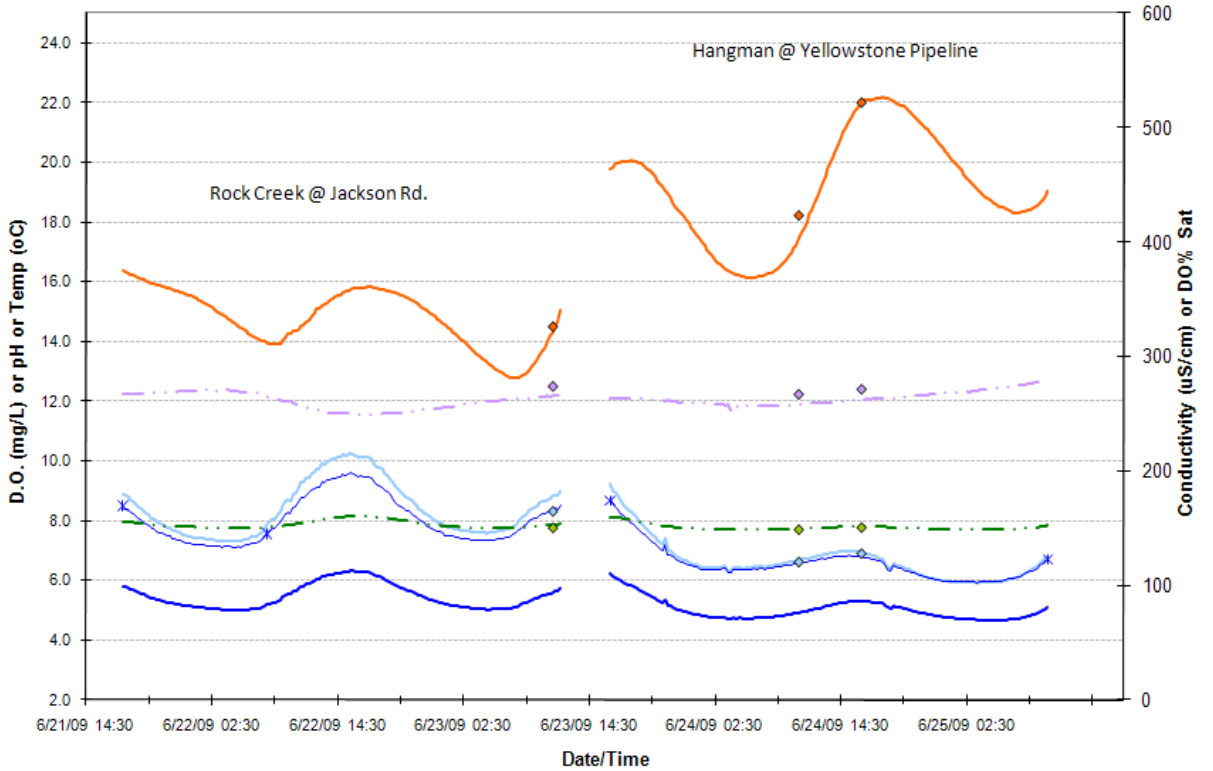


Figure G-14. Rock Creek @ Jackson Rd and Hangman @ Yellowstone Pipeline.

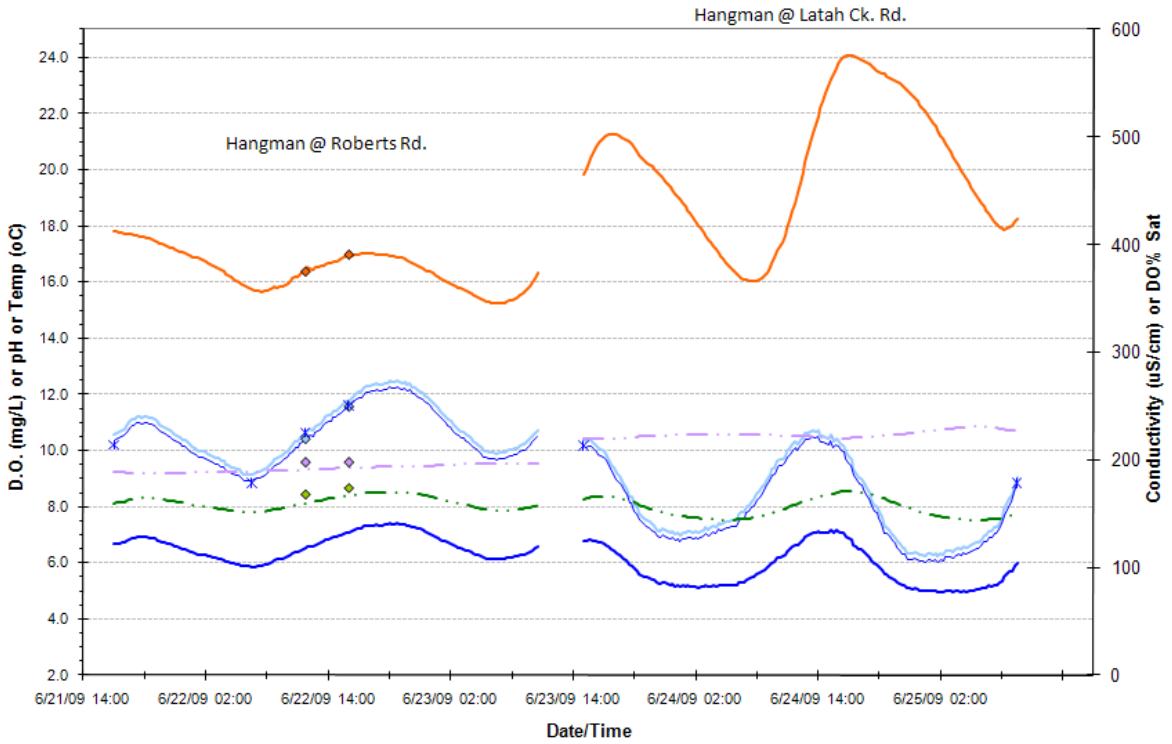


Figure G-15. Hangman @ Roberts Rd and Hangman @ Latah Creek Rd.

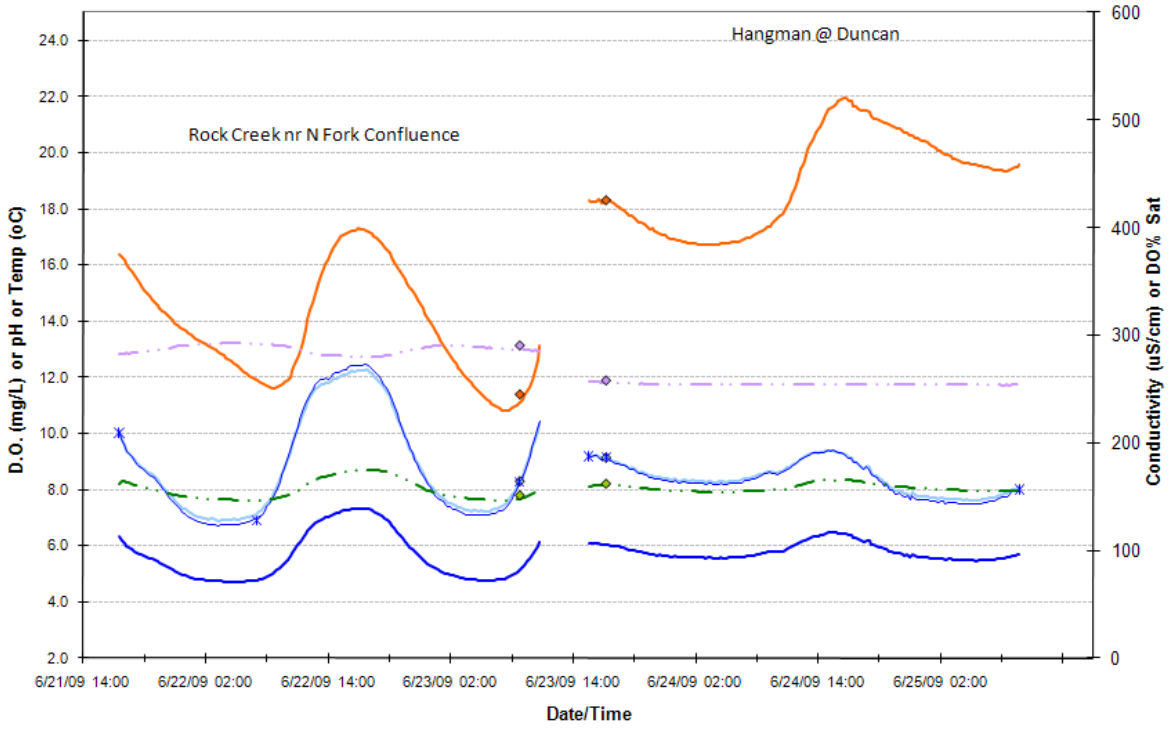


Figure G-16. Rock Creek near North Fork Confluence and Hangman @ Duncan.

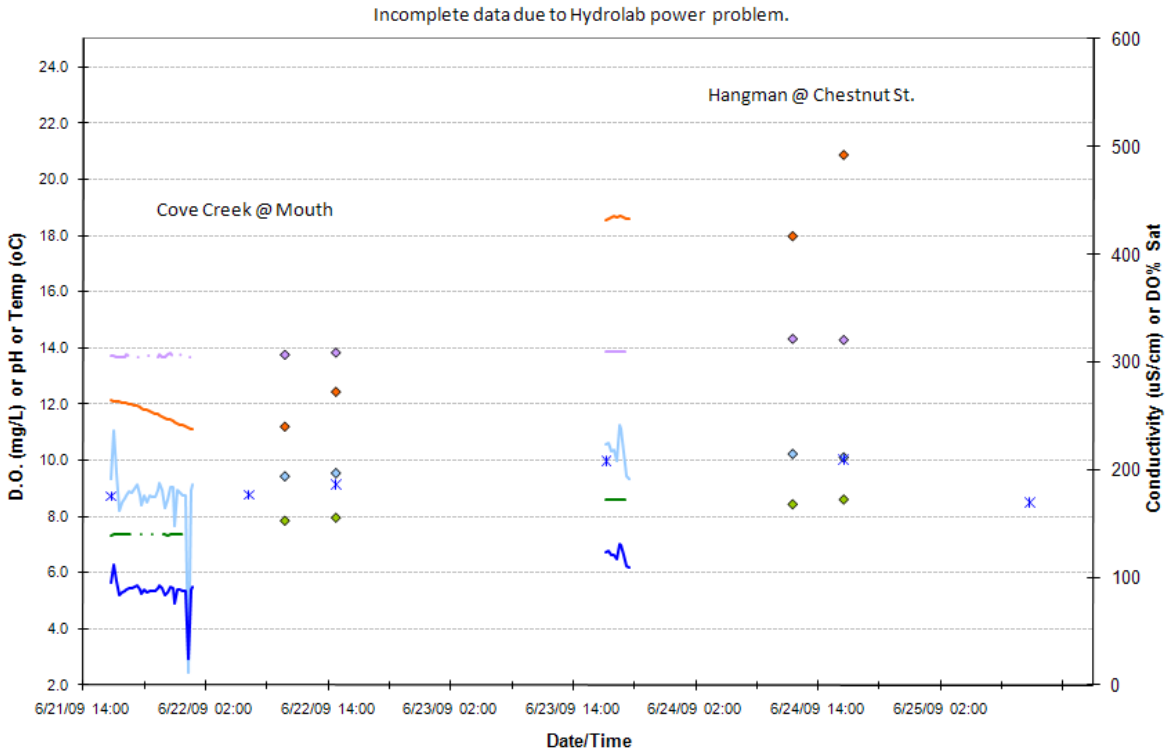


Figure G-17. Cove Creek @ Mouth and Hangman @ Chestnut St.

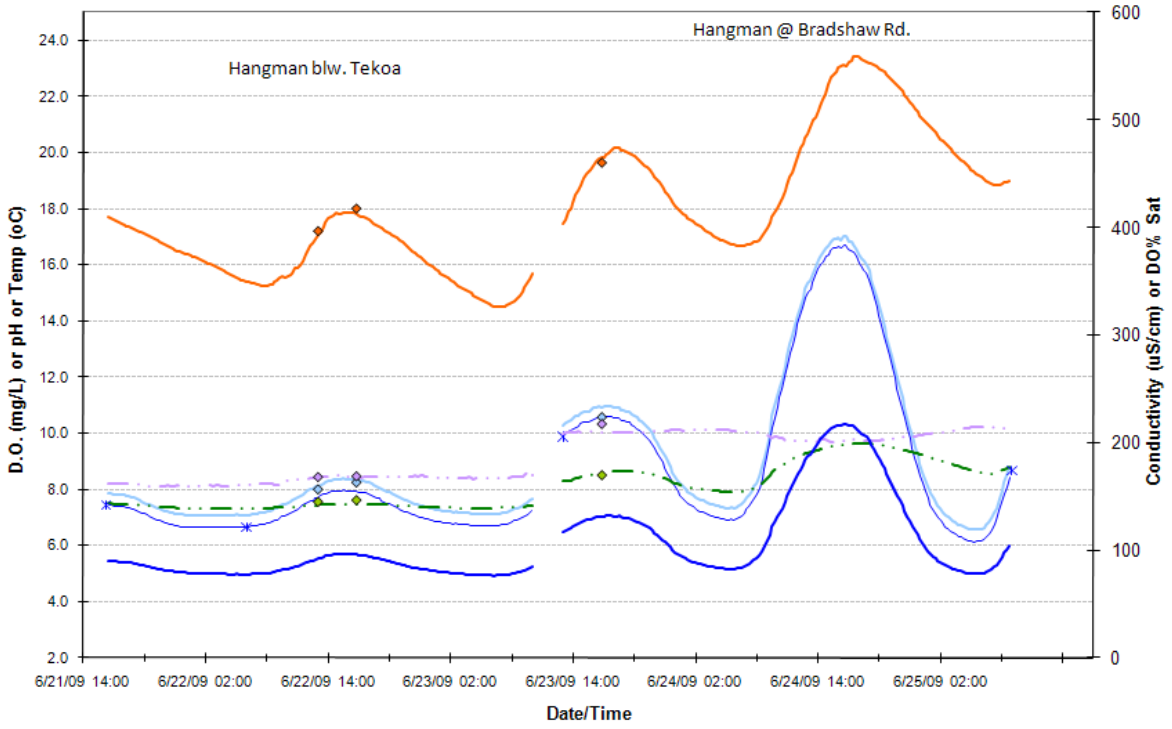


Figure G-18. Hangman below Tekoa and Hangman @ Bradshaw Rd.

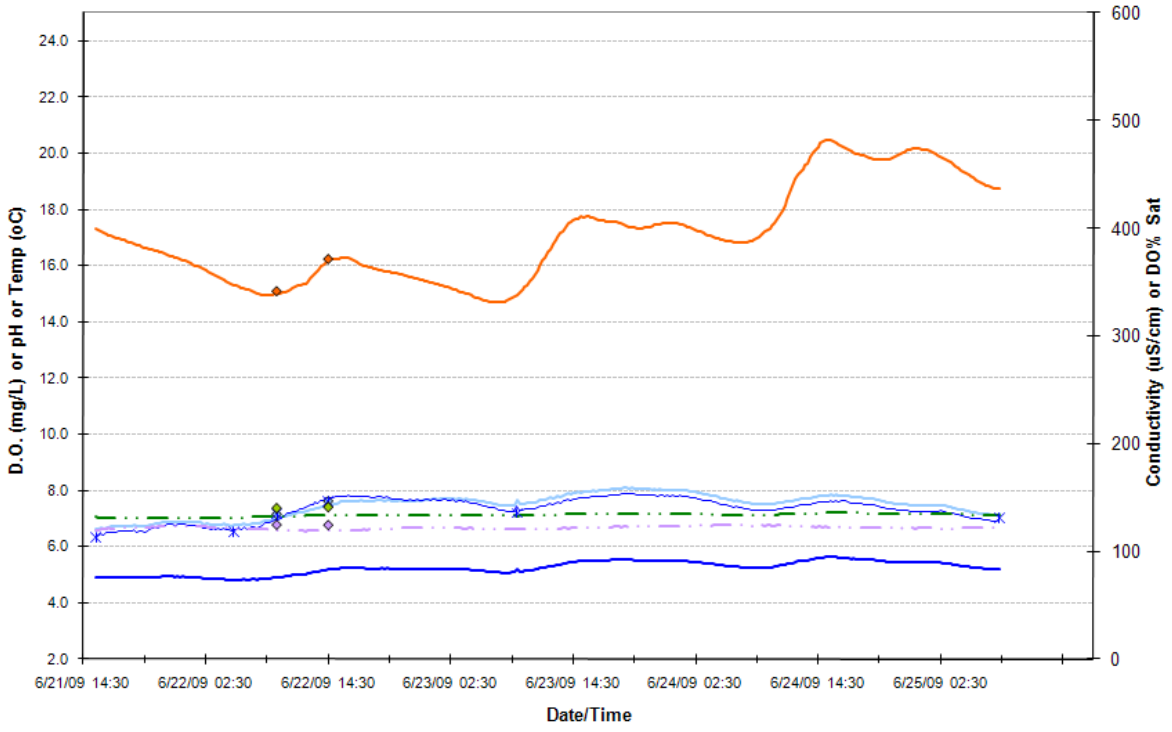


Figure G-19. Hangman @ State Line.

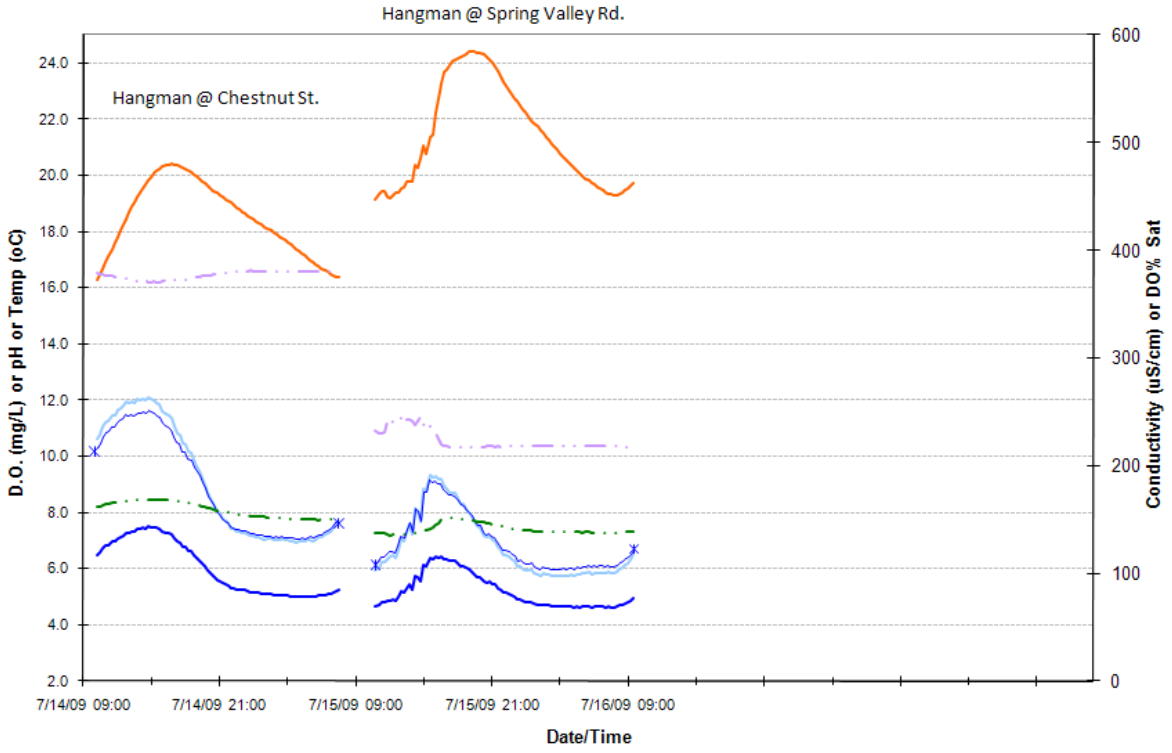


Figure G-20. Hangman @ Chestnut St. and Hangman @ Spring Valley Rd.

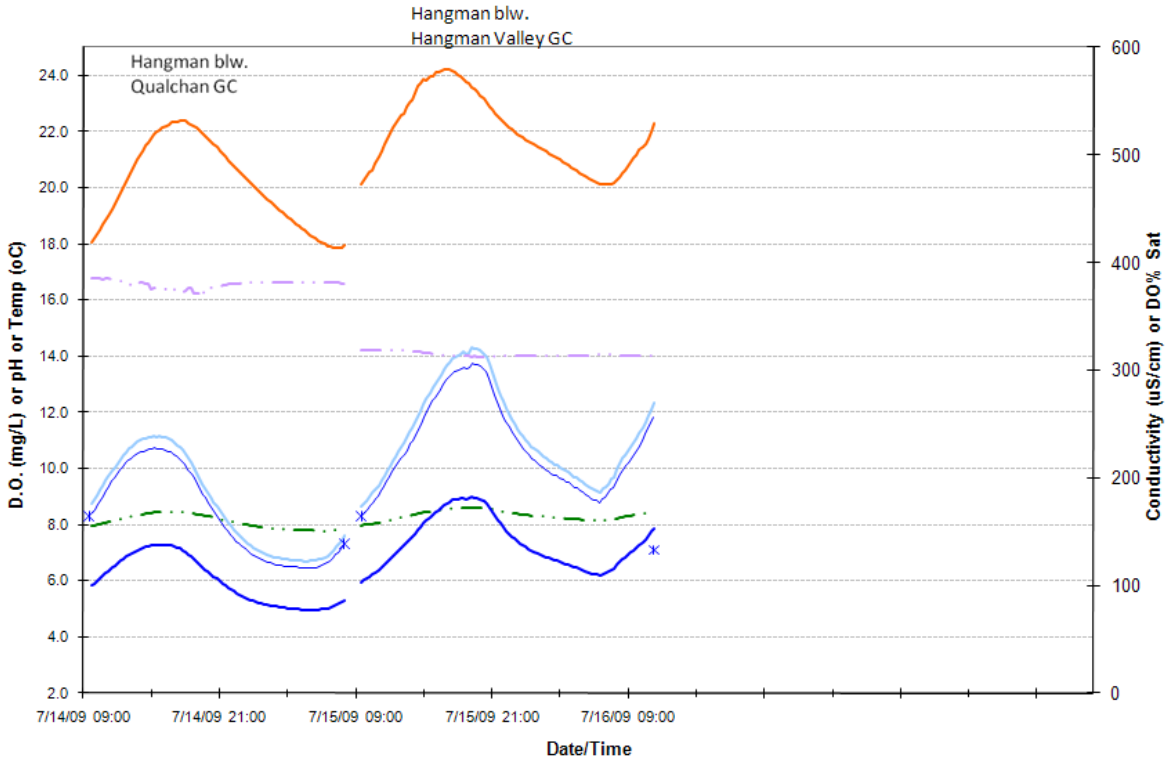


Figure G-21. Hangman below Qualchan GC and Hangman below Hangman Valley GC.

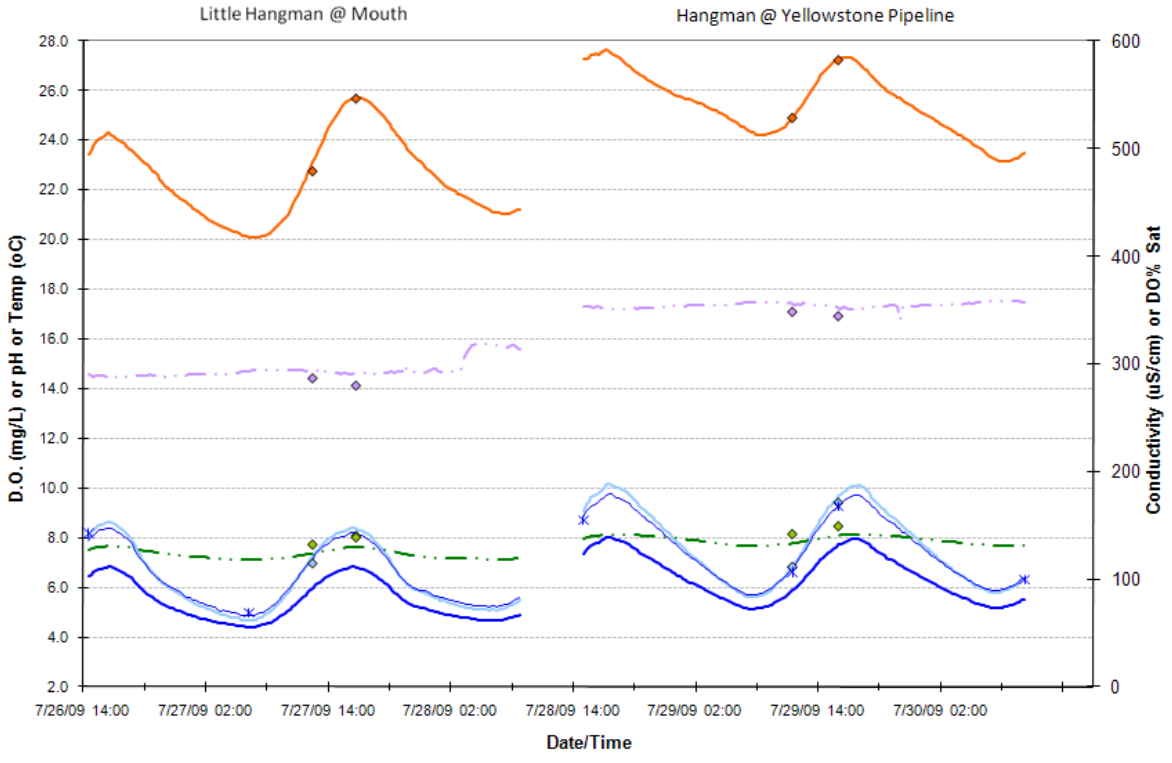


Figure G-22. Little Hangman @ Mouth and Hangman @ Yellowstone Pipeline.

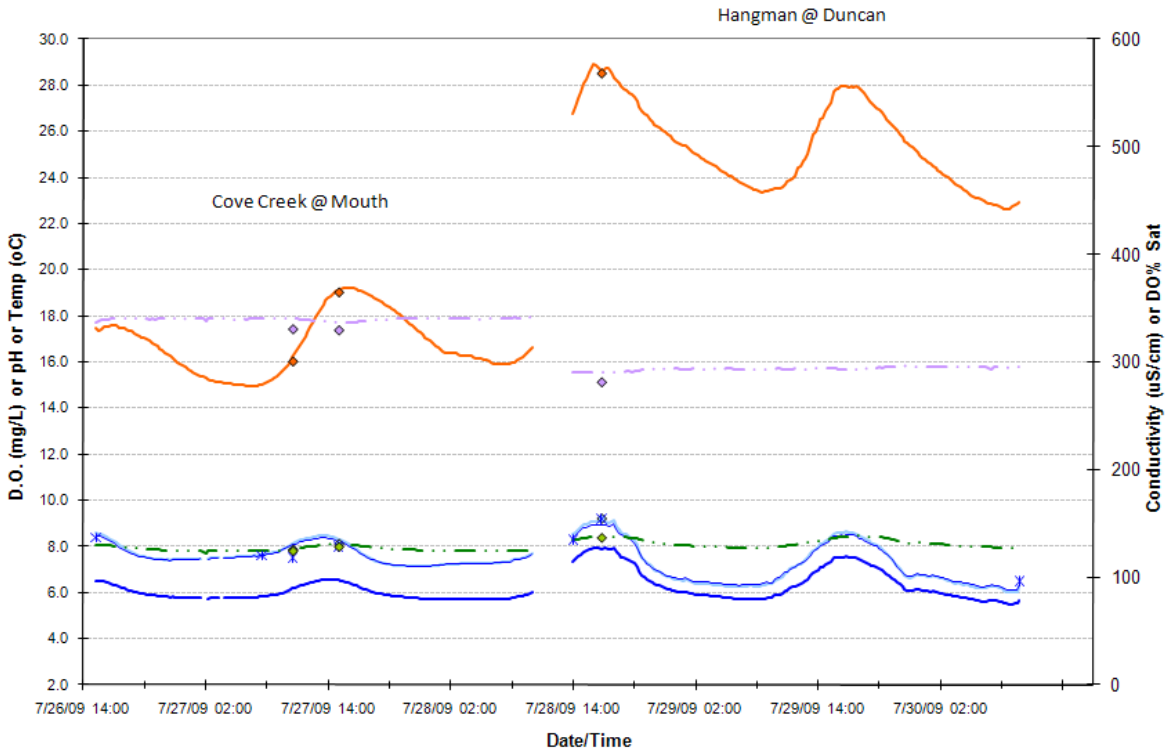


Figure G-23. Cove Creek @ Mouth and Hangman @ Duncan.

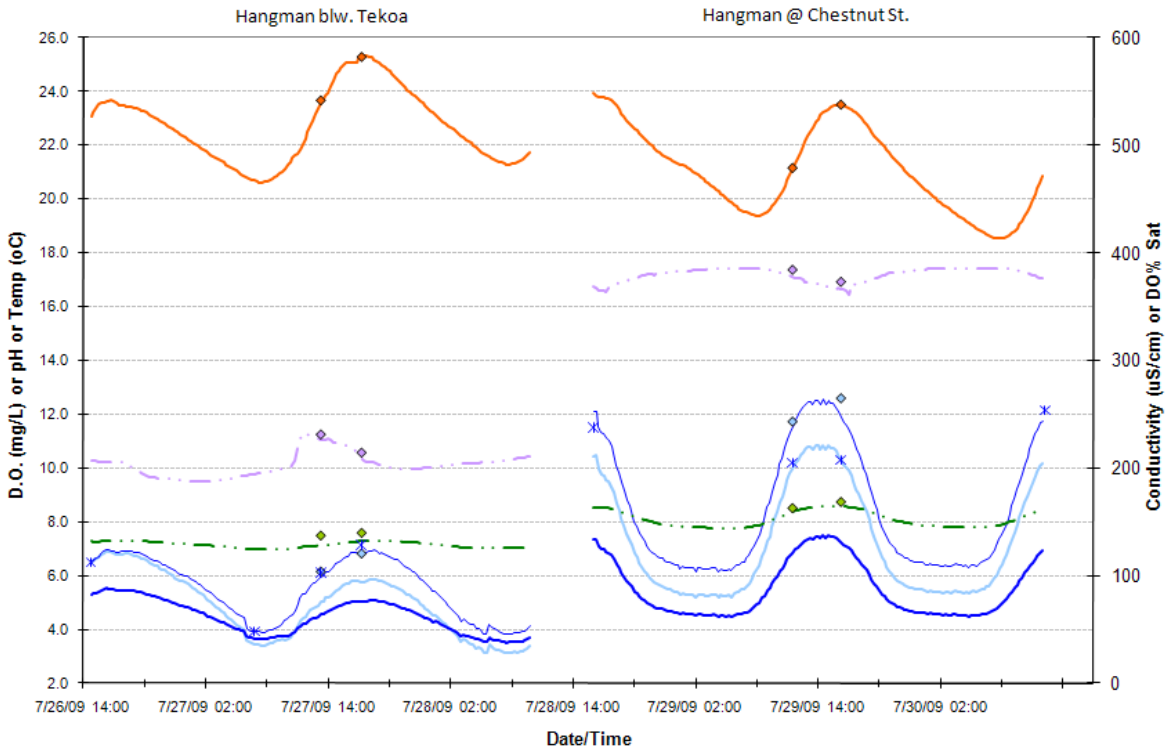


Figure G-24. Hangman below Tekoa and Hangman @ Chestnut St.

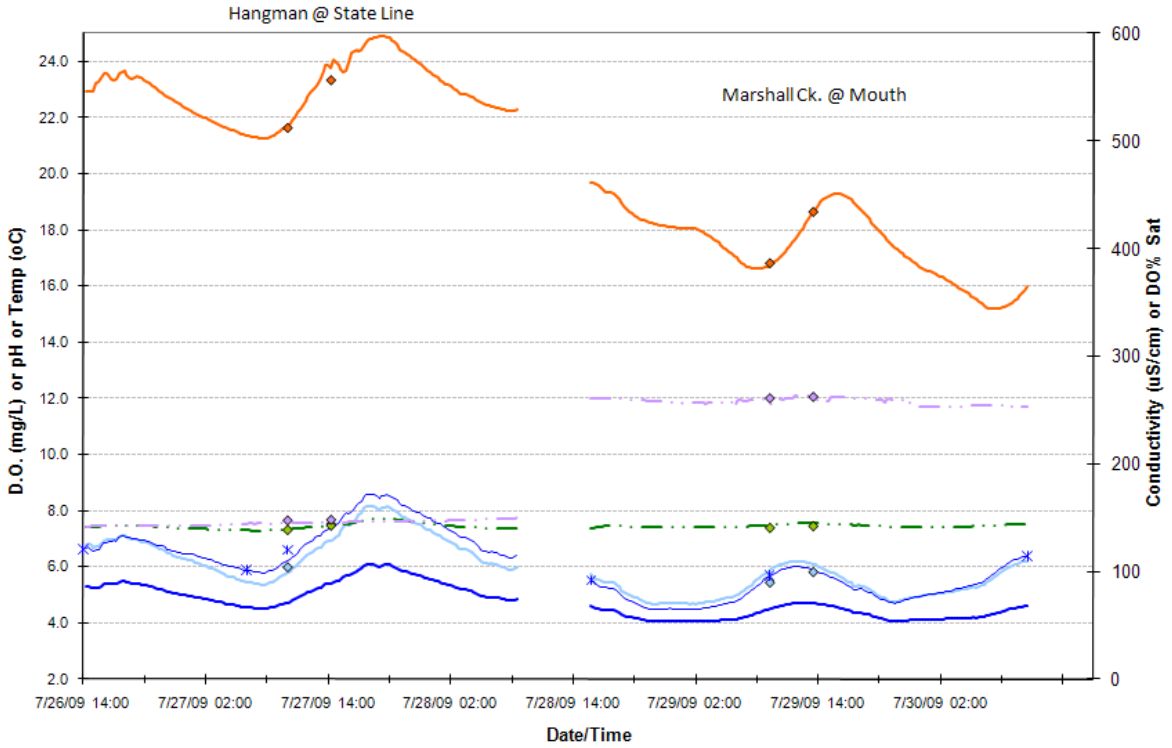


Figure G-25. Hangman @ State Line and Marshall Creek @ Mouth.

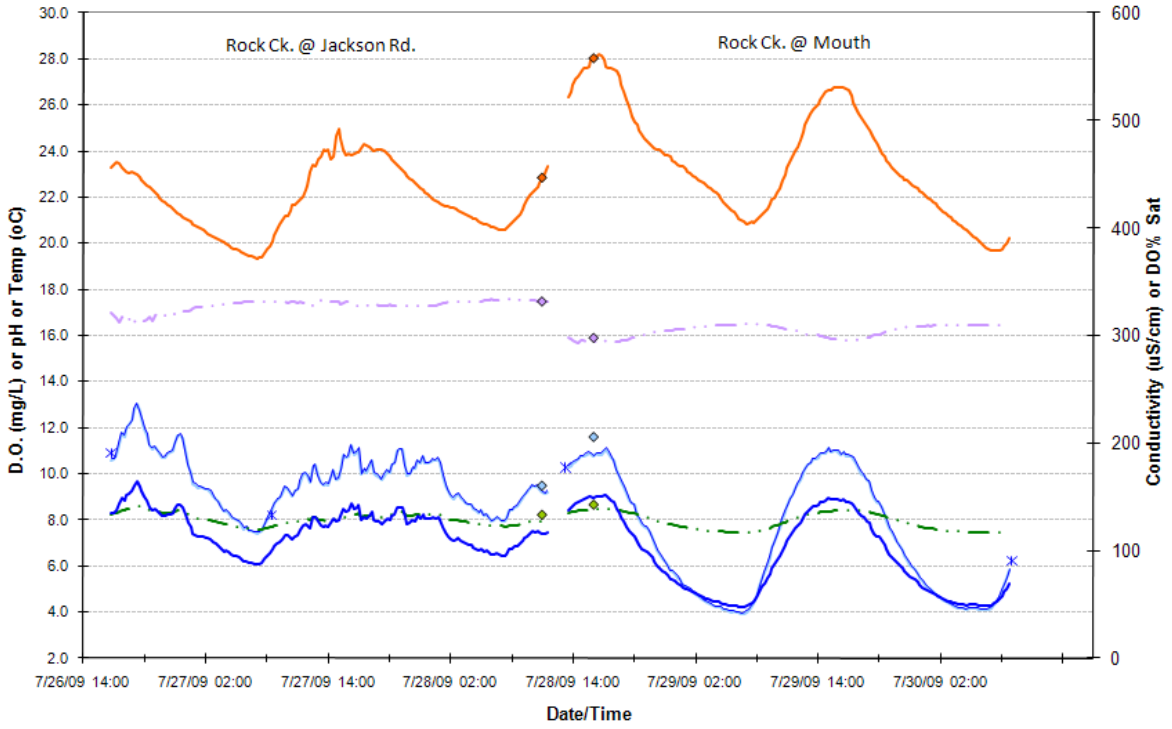


Figure G-26. Rock Creek @ Jackson Rd. and Rock Creek @ Mouth.

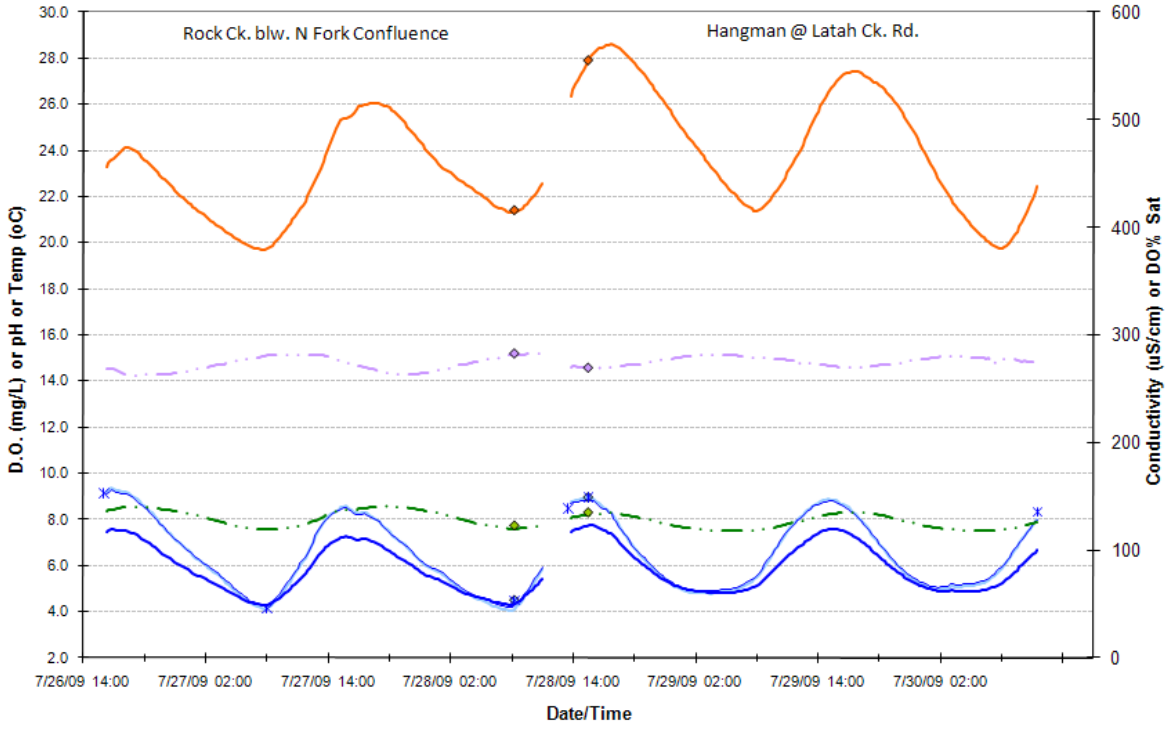


Figure G-27. Rock Creek below North Fork Confluence and Hangman @ Latah Ck. Rd.

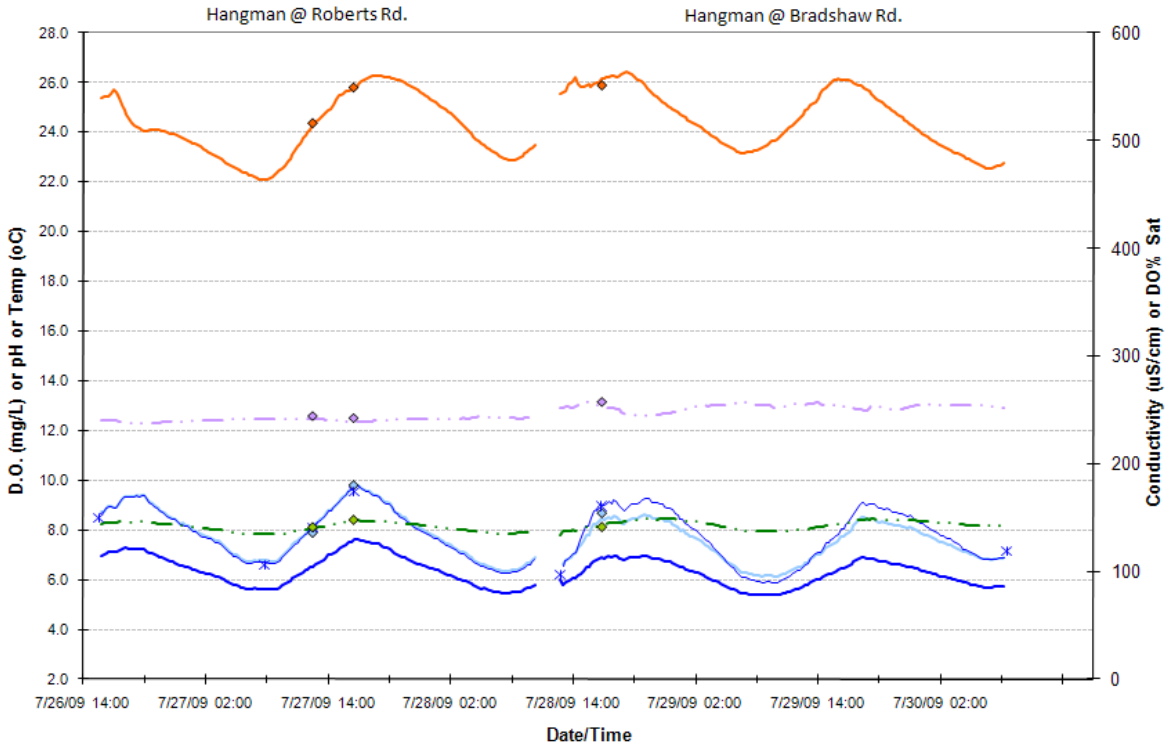


Figure G-28. Hangman @ Roberts Rd. and Hangman @ Bradshaw Rd.

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Appendix H. Laboratory Case Narrative Summaries

October 2008 sample #177908
All total organic carbon (TOC) and dissolved organic carbon (DOC) samples were analyzed outside of the holding times. The results were qualified as estimates.

December 2008 sample #0812017
All alkalinity samples were qualified as estimates. They were analyzed outside of the holding time due to analyst error. Sample 0812017-08 for DOC was qualified as an estimate. The precision of the analysis did not meet (exceeded) the quality control limit.

January 2009 sample #0901002
Sample 0901002-01 for orthophosphorus was analyzed outside of the holding time. The result was qualified as an estimate.

February 2009 sample #0902011
The associated matrix spike recovery for DOC was not calculated.

February 2009 runoff event sample #0902057
The results for sample 0902057-42 for ammonia (NH_3) may have been biased low. One of the associated matrix spike recoveries for DOC was not calculated.

June 2009 sample #0906033
One of the associated duplicate relative percent differences (RPDs) for total suspended solids (TSS) analysis was greater than the acceptance limit. The source and duplicate results were qualified as estimates.

June 2009 sample #0906034
Sample 0906034-01 for orthophosphate was analyzed outside of the holding time. The result was qualified as an estimate. One of the associated duplicate RPDs for TSS analysis did not meet (was greater than) the acceptance limit. The source and duplicate results were qualified as estimates.

June 2009 synoptic sample #0906046
One of the matrix spike recoveries for TOC analysis was greater than the acceptance limit. The source sample was qualified as an estimate. The results for samples 0906046-31 to -33 and -35 for ammonia analysis may be biased low due to matrix interference. The reporting limit for chloride analysis for samples -01 to -06, -08 to -14, -16 to -21, and -23 to -29 was raised to 0.5 mg/L.

June 2009 sample #0906052
The duplicate RPD for sample 0906052-06 for chlorophyll analysis was greater than the acceptance limit. The sample and duplicate were qualified as estimates.

July 2009 sample #0907030
The orthophosphate result in sample 0907030-08 was greater than the associated total phosphorus.

July 2009 synoptic sample #0907064
Sample 0907064-28 for DOC was not analyzed. The sample container leaked during transit and insufficient sample remained for analysis.

July 2009 sample #0907065
Sample 0907065-08 for chlorophyll was filtered outside of the holding time. The result was qualified as an estimate.