Walla Walla River Basin Fecal Coliform Bacteria and pH Total Maximum Daily Load Study, Data Summary Report

Abstract

As part of the *Walla Walla River Basin Fecal Coliform Bacteria and pH Total Maximum Daily Load (TMDL) Study*, the Department of Ecology conducted a series of water quality surveys from June 2002 through June 2003. This report presents data collected during these surveys, including field and laboratory water quality data and flow data. The quality assurance and quality control analysis of the data is also provided.

Data provided in this report will be used by Ecology to conduct a detailed scientific analysis and recommend pollutant loading limits for the Washington portion of the Walla Walla River basin.

Field data include pH, conductivity, dissolved oxygen, temperature, and flow. Laboratory data include fecal coliform, *E. coli*, *Enterococcus*, chloride, total suspended solids, total non-volatile suspended solids, alkalinity, chlorophyll *a*, biochemical oxygen demand, total persulfate nitrogen, nitrate+nitrite nitrogen, ammonia, total phosphorous, orthophosphate, total organic carbon, and dissolved organic carbon.

By Trevor Swanson
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Information on the Web

For more on Ecology's Walla Walla River Basin TMDL, visit http://www.ecy.wa.gov/programs/wq/tmdl/watershed/wallawalla/index.html.

Preliminary monitoring data and reports, including temperature, pesticide, and PCB data, are at http://www.ecy.wa.gov/programs/wq/tmdl/watershed/wallawalla/prelim_results.html.
A *Related Links Page* is also included for easy access to outside sources of Walla Walla Watershed information.

For data extracts or other web data queries, visit http://www.ecy.wa.gov/services/as/iip/eim/.
Study name: Walla Walla Bacteria and pH TMDL. Study ID: JJOY0003

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Introduction

The State of Washington listed the Walla Walla River, Touchet River, and Mill Creek under Section 303(d) of the federal Clean Water Act for non-attainment of Washington State fecal coliform bacteria and pH water quality standards. The listings are based on sampling conducted by the Washington State Department of Ecology (Ecology) since 1991.

The U.S. Environmental Protection Agency (EPA) requires states to set priorities for cleaning up 303(d)-listed waters and to establish a Total Maximum Daily Load (TMDL) for each. A TMDL study entails an analysis of how much of a pollutant load a waterbody can assimilate without violating water quality standards. This report summarizes the data collected as part of the *Walla Walla River Basin Fecal Coliform Bacteria and pH TMDL Study* during 2002 and 2003.

The TMDL study determines if the Walla Walla River and its tributaries, the Touchet River and its tributaries, and Mill Creek are in compliance with water quality standards so that all applicable beneficial uses are available (Table 1). Through the TMDL study, historical and current water quality data are evaluated, and the decision for setting TMDL targets or excluding waterbody segments from the next 303(d) list are made. The TMDL targets are set when the loading capacities of waterbodies are determined and pollutant limits, or allocations, are recommended for point and nonpoint sources. An implementation strategy is designed around these recommendations to reduce pollutant loading from the sources and to meet the TMDL limits within a set schedule.

The goals for the Walla Walla fecal coliform and pH TMDL study are listed below:

- Determine the geographic and seasonal extent of bacterial contamination to the Walla Walla River and the Touchet River, and where appropriate propose reductions in sources, reaches, or tributaries in the form of TMDL load and wasteload allocations.

- Calculate the loading capacity for pH in Mill Creek, the Walla Walla River, and other areas in the Walla Walla basin as appropriate. Set load allocations for various tributaries and reaches using one or more appropriate parameters, e.g., limiting nutrients, temperature, or light.

- Determine if there is a dissolved oxygen or nutrient/primary productivity problem in the mainstem Walla Walla River, Touchet River, and Mill Creek. If necessary, calculate the seasonal loading capacity for limiting nutrients and oxygen-demanding substances in portions of the Walla Walla River, Touchet River, and Mill Creek to meet the dissolved oxygen criterion. Set seasonal load allocations and wasteload allocations for sources.

Table 1. Water quality criteria that will be used to determine if Walla Walla River basin waters are supporting beneficial uses.

Parameter	Criteria Category	Statistic	Criterion
Fecal Coliform	Class AA Freshwater	Geometric mean 90th percentile value[1]	50 cfu/100 mL 100 cfu/100 mL
	Class A Freshwater	Geometric mean 90th percentile value[1]	100 cfu/100 mL 200 cfu/100 mL
	Class B Freshwater	Geometric mean 90th percentile value[1]	200 cfu/100 mL 400 cfu/100 mL
pH	Freshwater	Minimum Maximum	6.5 8.5
Dissolved Oxygen	Class AA Freshwater	Minimum	9.5 mg/L
	Class A Freshwater	Minimum	8.0 mg/L
	Class B Freshwater	Minimum	6.5 mg/L
	Class B Freshwater – Special Condition[2]	Minimum	5.0 mg/L

[1] Criteria wording states that not more than 10% of the samples obtained for calculating the geometric mean shall exceed the criterion.
[2] Lower 6.4 mi. of Mill Creek special condition.

303(d) Listings and Water Quality Criteria

The Walla Walla River at river mile (RM) 15.3, Touchet River (RM 0.5), and Mill Creek (RM 10) are on the 1998 303(d) list for bacteria and pH based on Ecology's previous monitoring work (Table 2). Temperature and pesticides are also on the 303(d) list, although not necessarily in the same locations along the waterbodies.

Table 2. Walla Walla River basin waterbodies on the 1998 303(d) list.

Waterbody	Old WBID	New WBID	Parameters
Walla Walla River	WA-32-1010	QE90PI	**Fecal Coliform**, **pH**, Temperature, Heptachlor, PCB-1260, Hexachlorobenzene, Heptachlor Epoxide, 4,4'-DDT, 4,4'-DDE, Dieldrin, Chlordane
Touchet River	WA-32-1020	LV94PX	**Fecal Coliform**, Temperature
Mill Creek	WA-32-1060	SS77BG	**pH**, Temperature

Bold type indicates parameters addressed in this TMDL evaluation.
WBID is the waterbody identification number. Old WBIDs were used in the 1996 303(d) list, and new WBIDs were used in the 1998 list.

Basin Description and Water Quality Classifications

The Walla Walla River is located in the southeast corner of Washington State (Figure 1). The river extends 61 river miles from the forested headwaters of its north fork in Oregon to its

confluence with the Columbia River in Washington. The drainage basin covers approximately 1,760 square miles and flows through four counties: Umatilla and Wallowa counties in Oregon, and Columbia and Walla Walla counties in Washington. Two-thirds of the Walla Walla drainage basin and the last 40 miles of the mainstem lie within Washington. Major tributaries include the Touchet River, Mill Creek, and Dry Creek.

The Walla Walla basin is predominantly rural with few urban areas. The major towns are Walla Walla and College Place, with a combined population of less than 45,000. Smaller towns of Dayton, Waitsburg, and Milton-Freewater (Oregon) support surrounding agriculture. Cropland composed about 74 percent of the 813,120 total acres in Walla Walla County in 1997. At the same time, about 12 percent of Walla Walla County was irrigated. There has been a steady increase in the acres of irrigated croplands in the Walla Walla subbasin since the mid 1800s, with nearly a 30 percent increase between 1987 and 1997 (National Agricultural Statistics Service, 1997). Currently, spring and fall wheat, alfalfa seed and hay, and peas are the largest percentage of the irrigated crops. Other crops include grapes, apples, asparagus, barley, and onions. Headwaters are mostly forest and rangeland managed by the U.S. Forest Service.

The four primary forks of the Touchet River (Robinson Creek, Wolf Creek, North Fork Touchet, and South Fork Touchet) originate deep in the Blue Mountains at an elevation of 6,074 feet. The four forks are mainly located in forested areas of the Blue Mountain Ecoregion with some small farms in the valleys. As the forks converge just above the city of Dayton to form the mainstem Touchet River, the river enters the Columbia Basin Ecoregion. The Touchet River flows through the cities of Dayton, Waitsburg, and Prescott reaching its confluence with the Walla Walla River by the town of Touchet at an elevation of 469 feet. Land use in the Touchet basin from Dayton to the confluence of the Walla Walla River is predominantly agricultural with both irrigated and non-irrigated crops.

Washington State water quality classifications for the study area are shown in Table 3. Mill Creek flows from Class AA municipal watershed conditions in the Blue Mountains. Most of Walla Walla's drinking water comes from the 36-square-mile managed and protected portion of upper Mill Creek. At RM 25.2, site of the water supply "waterworks" dam, the creek becomes Class A until RM 6.4 at the 13th Street bridge in the city of Walla Walla. The creek flows through agricultural and urban/residential areas in this section. The division and diversion structures at RM 10.5 are used for flood control and irrigation operations. Much of the water is diverted to Yellowhawk and Garrison creeks from May through October. The creek channel is armored and groined from RM 11.5 to RM 4.5 for flood control. Portions of the creek that are not entirely concrete have revetments to stabilize the banks and a rubble bottom. Below RM 6.4, the creek is Class B (with additional special conditions – see Table 3) through the western part of the city of Walla Walla and the agricultural areas to the confluence with the Walla Walla River.

Dry Creek is located in a 239-square-mile basin with elevations from 450 feet at the confluence with the Walla Walla River near Lowden to 4,600 feet in the Blue Mountains. Dry Creek's watershed is mainly used for dry wheat agriculture with only sparse forests in the headwaters.

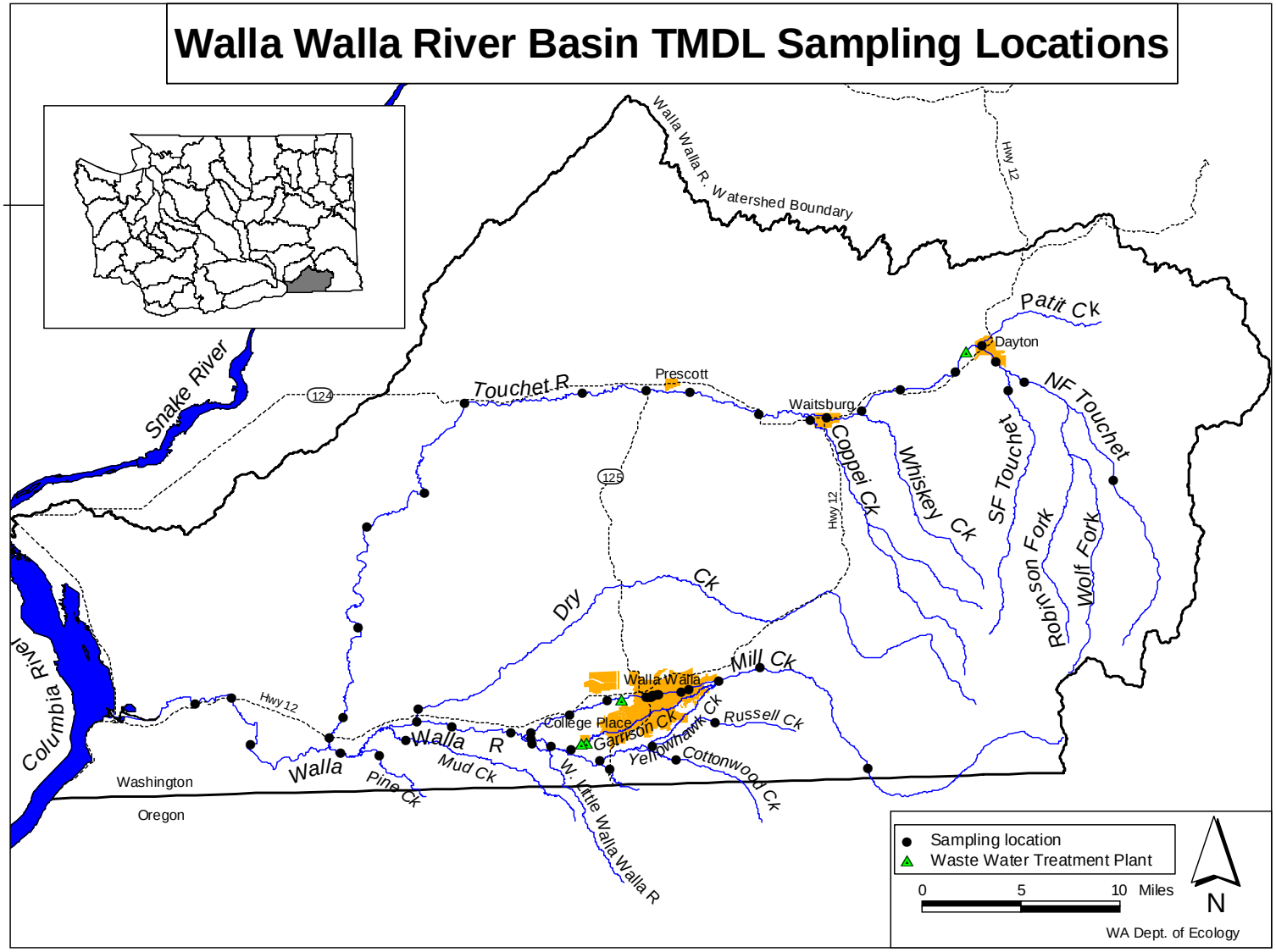

Figure 1. TMDL Sampling Sites in the Walla Walla Watershed.
Site descriptions and other site information are located in Appendix A.

Table 3. Water quality classifications for the Walla Walla River, Touchet River, North Fork Touchet River, and Mill Creek in the Walla Walla basin.

Waterbody	Location	Special Conditions	Class
Walla Walla River	Mouth to Dry Creek (RM 27.2)	NA	B
	Lowden (Dry Creek at RM 27.2) to Oregon border (RM 40)	Temperature shall not exceed 20.0ºC due to human activities. When natural conditions exceed 20.0ºC, no temperature increase will be allowed which will raise the receiving water temperature by greater than 0.3ºC.	A
Touchet River	Mouth to confluence of north and south forks	NA	A
NF Touchet River	At Dayton water intake structure (RM 3.0) to headwaters	NA	AA
Mill Creek	Mouth to 13th St. Bridge (RM 6.4)	Dissolved oxygen concentration shall exceed 5.0 mg/L.	B
	13th St. Bridge to Walla Walla Waterworks Dam (RM 11.5)	NA	A
	City of Walla Walla Waterworks Dam (RM 21.6) to headwaters	No waste discharge will be permitted.	AA

Methods

Ecology divided the study area into three subbasins for sampling: Walla Walla River, Touchet River, and Mill Creek. A team of two people sampled these areas over the course of three to five days during each survey period. Sample dates for each of the 59 sites are listed in Appendices B and C. Dissolved oxygen and pH survey dates are shown in Appendix E. Methods for collecting laboratory parameters, field parameters, and flow measurements are described in more detail in Ecology's field measurements and sampling protocols manual (Ecology, 1993), and in the *Quality Assurance Project Plan*: *Walla Walla River Basin Bacteria and pH TMDL Study* (Swanson and Joy, 2002). Table 4 is a summary of the field and laboratory methods used for the surveys.

Table 4. Methods used for field measurements and laboratory determinations.

	Abbreviation	Method[1]	Range (including detection limit)
Field Measurements			
Velocity		Current meter	0 – 9 ft/sec.
pH	pH	Hydrolab® meter	4 – 10 s.u.
Temperature	Temp	Hydrolab® meter	-5 – 50 ° C
Dissolved oxygen	DO	/4500OC (Winkler)	0 – 20 mg/L
Dissolved oxygen	DO	Hydrolab® meter	0 – 20 mg/L
Specific conductivity	SpCond	Hydrolab® meter	1 – >500 umhos/cm
Laboratory Determination			
Fecal coliform (MF)	FC	/16-909C	<1 – > 5000 cfu/100 mL
Enterococci	Entero	1600/	<1 – > 5000 cfu/100 mL
E. Coli	EC	1103.1/	<1 – > 5000 cfu/100 mL
5-day Biochemical oxygen demand	BOD5	405.1/5210B	<2 – 20 mg/L
Chlorophyll *a*	Chl a	/10200H3	<1 – 100 ug/L
Periphyton chlorophyll *a*	Periphyton	/10200H3	<1 – 100 ug/L
Total organic carbon	TOC	415.1/	1 – 20 mg/L
Dissolved organic carbon	DOC	415.1/	1 – 20 mg/L
Total suspended solids	TSS	160.2/2540D	1 – 5000 mg/L
Total non-volatile sus. solids	TNVSS	160.4/2540E	1 – 5000 mg/L
Chloride	Cl	300.0/	0.5 – 200 mg/L
Alkalinity	Alk	/2320	10 – 500 mg/L
Total persulfate nitrogen	TPN	/4500NB	0.5 – 20 mg/L
Ammonia nitrogen	NH3	/4500-NH3H	<0.01 – 20 mg/L
Nitrate-nitrite nitrogen	NO2/NO3	/4500NO3I	0.05 – 10 mg/L
Orthophosphate	OP	/4500PG	<0.005 – 0.5 mg/L
Total phosphorus	TP	200.8M/4500PI	0.01 – 10 mg/L

[1] USEPA, 1983; APHA et al., 1998 (Standard Methods)

Streamflows

Ten on-site continuous flow-monitoring and manual stage-height stations, established by Ecology's Stream Hydrology Unit, were used to obtain streamflows at selected sites during sampling. The standard protocols for the on-site continuous dataloggers followed those established by the Stream Hydrology Unit (Ecology, 2000a). Discharge monitoring reports were used to obtain wastewater treatment plant discharge records. Ecology will use streamflow data provided by the U.S. Geological Survey, Washington State Department of Fish and Wildlife, and the U.S. Army Corps of Engineers to help fill any gaps in Ecology's flow monitoring. Only Ecology's instantaneous and continuous flow data are included in Appendix D.

Ecology measured instantaneous flows at all wadable sites without continuous flow-monitoring stations when samples were taken. Discharge was calculated by measuring velocities and depths in 16 or more divisions of a cross-section (Ecology, 1993). Fewer divisions were measured if necessary on small streams. The record of instantaneous measurements at these sites will be compared to the discharge record of nearby continuous monitoring sites. Correlations will be developed to create a continuous or partially-continuous record for the sites.

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 also calibrated Hydrolab® pH three times daily and compared Hydrolab® dissolved oxygen (DO) measurements with Winkler DO samples taken at every other site (Appendix C). This assessed accuracy and reliability of the meter better than post-checks alone.

Manchester Environmental Laboratory performed duplicate analyses of about 10 percent of all samples (Table 5). Some nutrient analyses fell slightly short of the 10 percent goal. The results for laboratory duplicates provide an estimate of analytical precision, including homogeneity of the sample matrix (Manchester Laboratory, 2000).

Table 5. Measurement quality objectives and results of laboratory duplicates. Data quality was found to be adequate to use for the purposes of this study.

Parameter	Median RSD (percent)	Average RSD (percent)	Average RPD (percent)	Precision Standard (RSD percent)	Number of duplicates taken	Total number of samples (less duplicates)	Percent of total samples duplicated
Alk	0.22	0.57	1.82	10	22	211	10
BOD5	0.00	0.00	1.15	25	6	24	25
Chl a	1.65	2.43	15.31	20	52	321	16
Cl	1.05	1.59	7.97	5	52	518	10
DOC	2.67	3.62	3.23	10	21	263	8
EC	2.41[1]	11.14[1]	2.22[1]	25[1]	55	228	24
Entero	0.00[1]	0.00[1]	0.00[1]	25[1]	1	3	33
FC	3.89[1]	15.03[1]	2.24[1]	25[1]	56	518	11
NH3	1.49	2.10	16.17	10	33	353	9
NO2/NO3	0.13	0.38	15.06	10	29	353	8
OP	0.51	0.70	10.91	10	34	347	10
TNVSS	0.00	1.54	16.88	10	36	141	26
TOC	2.72	3.65	3.54	10	24	270	9
TP	1.36	1.87	10.63	10	30	353	8
TPN	1.26	1.91	7.14	10	26	351	7
TSS	0.00	1.18	24.02	10	59	507	12
Periphyton	1.44	2.45	1.50	20	5	36	14

[1] Logtransformed data
RSD - Relative standard deviation
RPD - Relative percent difference

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 6. *E. coli* and fecal coliform did not meet Quality Assurance Project Plan replication frequency goals.

Table 6. Measurement quality objectives and results of field replicates. Data quality was found to be adequate to use for the purposes of this study.

Parameter	Median RSD (percent)	Average RSD (percent)	Average RPD (percent)	Precision Standard (RSD percent)	Number of replicates taken	Total number of samples (less replicates)	Percent of total samples replicated
Alk	0.46	0.54	1.27	10	18	211	9
BOD5	0.00	3.57	1.56	25	8	24	33
Chl a	3.47	4.08	3.65	20	34	321	11
Cl	0.47	2.38	10.42	5	62	518	12
DOC	2.57	3.66	3.19	10	36	263	14
EC	3.45[1]	12.38[1]	1.78[1]	25[1]	42	228	18
Entero	0.16[1]	0.16[1]	0.00[1]	25[1]	1	3	33
FC	3.37[1]	10.68[1]	1.96[1]	25[1]	63	518	12
NH3	0.55	4.17	13.80	10	38	353	11
NO2/NO3	0.00	0.64	14.67	10	38	353	11
OP	0.47	0.78	13.69	10	36	347	10
TNVSS	0.00	6.37	11.02	10	15	141	11
TOC	2.89	5.09	3.95	10	37	270	14
TP	1.70	1.86	10.56	10	38	353	11
TPN	1.58	2.52	13.63	10	37	351	11
TSS	0.00	9.64	27.45	10	59	507	12
Periphyton	13.26	21.58	0.99	20	6	36	17

[1] Logtransformed data
RSD - Relative standard deviation
RPD - Relative percent difference

Ecology calculated median and average relative standard deviation (RSD) and average relative percent difference (RPD), expressed as percent, to compare against each parameter's precision target set forth in the Quality Assurance Project Plan for both field and laboratory duplicates (Swanson and Joy, 2002) (Tables 5 and 6). These statistical measures are defined in Lombard and Kirchmer (2004), Appendix G. All parameters fell within their respective precision targets.

Ecology compared Hydrolab® DO grab sample results and Winkler titration results using percent RSD (Appendix C). Datalogger graphs show where Ecology compared pH to another calibrated Hydrolab® meter and checked DO for accuracy by performing Winkler titrations (Appendix E).

Conductivity and pH checks were within the specified target accuracy, with few exceptions. Hydrolab® DO grab results fell outside quality objectives (5% RSD) 35 percent of the time. Continuous datalogger DO results fell outside objectives only occasionally. 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 Walla Walla bacteria and pH TMDL study are arranged by site and date and presented in the following appendices:

- Appendix A shows site descriptions and other site information.
- Appendix B, Table B-1, shows all bacteria-related parameter results. Table B-2 lists nutrient and pH-related laboratory results.
- Appendix C contains field meter and Winkler dissolved oxygen measurements.
- Appendix D lists Ecology's instantaneous and continuous flow results.
- Appendix E shows Hydrolab DataSonde® continuous pH, dissolved oxygen, and temperature graphs.
- Appendix F contains time series charts showing seasonal pH and dissolved oxygen trends in Mill Creek and the Walla Walla and Touchet rivers. Since pH and dissolved oxygen values changed throughout the day in response to physical and biochemical processes, and these charts compare grab sample data taken at different times of the day, comparisons between sites should be limited.

Manchester Laboratory performed all laboratory analyses within specified holding times using appropriate quality assurance measures unless noted with qualifier codes (Table 7). 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.

Table 7. Data qualifier codes.

Qualifier	Definition
J	The analyte was positively identified. The associated numerical result is an estimate. Often denotes samples analyzed past their holding time (mostly bacteria samples).
U	The analyte was not detected at or above the reported result.
UJ	The analyte was not detected at or above the reported estimated result.
G	Value is greater than result reported.
E	Reported result is an estimate.

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Appendices

A. Site Descriptions
B. Laboratory Results
C. Field Measurements
D. Ecology Flow Monitoring
E. Datalogger Results
F. pH and Dissolved Oxygen Time Series Charts

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Appendix A

Site Descriptions

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Table A-1. Walla Walla River basin TMDL site identification codes and descriptions.

Station ID	River or Tributary Mile	Station Description	NAD83 Latitude	NAD83 Longitude
32COL-GARR	NA	College Place WWTP at outfall to Garrison Creek	46.0312	-118.4185
32COL-WWTP	NA	College Place WWTP at sump before lagoons	46.0312	-118.4185
32COP-00.5	0.5	Coppei Creek at HWY124	46.2690	-118.1675
32COT-01.0	1.0	Cottonwood Creek at Braden Rd.	46.0256	-118.3461
32DAY-WWTP	NA	Dayton WWTP just before outfall to Touchet River	46.3160	-118.0036
32DRY-00.5	0.5	Dry Creek at HWY 12	46.0568	-118.5899
32GAR-00.5	0.5	Garrison Creek at Mission St.	46.0281	-118.4282
32MIL-00.5	0.5	Mill Creek at Swegle Rd.	46.0416	-118.4709
32MIL-02.8	2.8	Mill Creek at Wallula Ave.	46.0540	-118.4306
32MIL-04.8	4.8	Mill Creek at Gose St.	46.0643	-118.3886
32MIL-06.7	6.7	Mill Creek at 9th St.	46.0657	-118.3499
32MIL-06.9	6.9	Mill Creek at 6th St.	46.0662	-118.3458
32MIL-07.0	7.0	Mill Creek at 5th St.	46.0665	-118.3443
32MIL-07.1	7.1	Mill Creek at 4th St.	46.0670	-118.3430
32MIL-07.2	7.2	Mill Creek at 3rd St.	46.0671	-118.3415
32MIL-07.3	7.3	Mill Creek at 1st and Main	46.0674	-118.3381
32MIL-07.4	7.4	Mill Creek at Colville St.	46.0676	-118.3366
32MIL-08.5	8.5	Mill Creek at Roosevelt St.	46.0690	-118.3125
32MIL-08.9	8.9	Mill Creek at Wilbur St.	46.0708	-118.3044
32MIL-11.5	11.5	Mill Creek near Reservoir Rd.	46.0764	-118.2729
32MIL-12.8	12.8	Mill Creek at Five Mile Rd.	46.0855	-118.2283
32MIL-21.1	21.1	Mill Creek at Mill Ck. Rd. near Kooskooskie	46.0097	-118.1195
32MIL-PIPE	NA	Pipe feeding into Mill Creek at 6th St.	46.0661	-118.3458
32MUD-00.5	0.5	Mud Creek at Borgen Rd.	46.0421	-118.6147
32NFT-00.0	0.0	N. Fork Touchet R. at S. Fork confluence	46.3014	-117.9599
32NFT-08.9	8.9	North Fork Touchet R. abv. Jim Creek	46.2161	-117.8467
32PAT-00.1	0.1	Patit Creek at Front St.	46.3204	-117.9833
32PIN-01.4	1.4	Pine Creek at Sand Pit Rd.	46.0281	-118.6318
32RUS-00.1	0.1	Russell Creek at McDonald Rd./Plaza Way	46.0291	-118.3447
32SFT-00.0	0.0	S. Fork Touchet R. at N. Fork confluence	46.3014	-117.9598
32TOU-00.5	0.5	Touchet River at HWY 12	46.0415	-118.6826
32TOU-02.0	2.0	Touchet R. at Cummins Rd.	46.0571	-118.6689
32TOU-07.0	7.0	Touchet R. at N. Touchet Rd.	46.1224	-118.6503
32TOU-14.2	14.2	Touchet R. at N. Touchet Rd.	46.1979	-118.6375
32TOU-17.8	17.8	Touchet R. at Luckenbill Rd.	46.2229	-118.5772
32TOU-25.0	25.0	Touchet R. off of Lamar Rd.	46.2885	-118.5319
32TOU-30.6	30.6	Touchet R. at Pettyjohn Rd.	46.2937	-118.4080
32TOU-34.2	34.2	Touchet R. at HWY 125	46.2943	-118.3405
32TOU-36.6	36.6	Touchet R. at Hart Rd.	46.2931	-118.2937
32TOU-40.5	40.5	Touchet R. at HWY 124	46.2740	-118.2213
32TOU-44.2	44.2	Touchet R. at HWY 12 in Waitsburg	46.2701	-118.1512
32TOU-46.2	46.2	Touchet R. at Lower Hogeye Rd.	46.2746	-118.1143
32TOU-48.4	48.4	Touchet R. at Lewis and Clark State Park	46.2903	-118.0714
32TOU-51.2	51.2	Touchet R. at Ward Rd.	46.3015	-118.0135

Table A-1. Walla Walla River basin TMDL site identification codes and descriptions.

Station ID	River or Tributary Mile	Station Description	NAD83 Latitude	NAD83 Longitude
32TOU-53.9	53.9	Touchet R. at Dayton City Park	46.3132	-117.9747
32WAL-09.3	9.3	Walla Walla River at Pierce's RV Park	46.0681	-118.8241
32WAL-12.0	12.0	Walla Walla R. at Hwy 12	46.0720	-118.7854
32WAL-15.6	15.6	Walla Walla R. at Cummins Bridge	46.0378	-118.7657
32WAL-22.7	22.7	Walla Walla R. at Touchet-Gardena Rd.	46.0292	-118.6707
32WAL-27.4	27.4	Walla Walla R. at Lowden Rd.	46.0522	-118.5913
32WAL-29.3	29.3	Walla Walla R. at McDonald Rd.	46.0522	-118.5913
32WAL-32.8	32.8	Walla Walla R. at Detour Rd.	46.0434	-118.4897
32WAL-34.0	34.0	Walla Walla R. at Swegle Rd.	46.0373	-118.4716
32WAL-35.2	35.2	Walla Walla R. at Last Chance Rd.	46.0307	-118.4512
32WAL-38.7	38.7	Walla Walla R. at Hwy 125	46.0123	-118.3896
32WAL-WWTP	NA	Walla Walla WWTP at outfall to Mill Creek	46.0648	-118.3763
32WLW-00.8	0.8	West Little Walla Walla River	46.0343	-118.4722
32YEL-00.2	0.2	Yellowhawk Creek at Old Milton Highway	46.0194	-118.3985
32YEL-03.5	3.5	Yellowhawk Creek at McDonald Rd.	46.0327	-118.3447

WWTP – Wastewater Treatment Plant

Appendix B

Laboratory Results

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Table B-1. Walla Walla River basin TMDL bacteria-related parameters survey results.

Station ID	Date	Time	Replicate	FC #/100mL	Entero #/100mL	E. coli #/100mL	Chloride mg/L	TSS mg/L	TNVSS mg/L
32COL-GARR	8/1/02	15:00		77		160	42.8	13	
32COL-GARR	9/11/02	15:00		1300 J		1200 J	44	5	4
32COL-GARR	9/11/02	9:30		1600 J		1600 J	44.1	8	6
32COL-WWTP	12/2/02	14:00		14		9			
32COL-WWTP	12/2/02	9:15					35.1	17	4
32COL-WWTP	12/3/02	13:40		45		39			
32COL-WWTP	1/15/03	13:05		8		3	35.8	6	1
32COL-WWTP	2/24/03	8:40					28.1	1 U	
32COL-WWTP	2/25/03	14:25		31		15			
32COL-WWTP	3/12/03	12:50		200		120	33.2	4	
32COL-WWTP	4/8/03	14:50		3 U		3 U	34.2	1	
32COL-WWTP	5/7/03	14:15		12		8	33.4	2	
32COL-WWTP	6/11/03	14:10		1900 J		1000	37.2	50	
32COP-00.5	7/30/02	15:20		220			1.45	4	3
32COP-00.5	9/3/02	13:25		200			1.51	6	5
32COP-00.5	4/21/03	14:45		9			1.27	6	4
32COP-00.5	5/26/03	14:00		96			1.2	5	4
32COP-00.5	6/23/03	13:46		230			1.48	4	3
32COT-01.0	8/1/02	13:10		310			1.79	2	
32COT-01.0	9/4/02	13:05		49			1.95	1 U	
32COT-01.0	4/23/03	13:00		2			1.03	4	
32COT-01.0	5/28/03	14:15		47			1.73	1	
32COT-01.0	6/25/03	14:10		14			2.93	1 U	
32DAY-WWTP	7/30/02	10:55		34		14	31.6	8	
32DAY-WWTP	9/11/02	12:25		6		3	28.2	8	1
32DAY-WWTP	12/2/02	12:20					31.8	9	3
32DAY-WWTP	12/2/02	12:35		4000 G		4000 G			
32DAY-WWTP	12/3/02	12:00		5400		4100			
32DAY-WWTP	1/14/03	11:50		9		11	34.3	10	
32DAY-WWTP	2/25/03	11:55		430		130	35.2	10	
32DAY-WWTP	2/25/03	11:55	Y	290		80			
32DAY-WWTP	3/11/03	10:15		1300		8 U	34.8	10	
32DAY-WWTP	4/7/03	11:05		23		23	33.7	9	
32DAY-WWTP	5/6/03	10:30		9		12	121	8	
32DAY-WWTP	5/6/03	10:30	Y	4		19	125	8	
32DAY-WWTP	6/10/03	12:00		1		1	34.4	4	
32DAY-WWTP	6/10/03	12:00	Y	2		2	34.3	4	
32DRY-00.5	7/31/02	12:55		160			21.3	4	
32DRY-00.5	9/5/02	10:25		80			18.5	3	
32DRY-00.5	4/24/03	11:40		120			6.15	8	
32DRY-00.5	5/29/03	11:55		300			17	4	
32DRY-00.5	6/26/03	13:39		320			16.9	3	
32GAR-00.5	6/27/02	14:55		200			16.1	7	
32GAR-00.5	7/11/02	16:45		900 J			23.2 J	3 J	
32GAR-00.5	8/1/02	11:25		180			37.9	15	
32GAR-00.5	8/14/02	14:40		320			40	1 U	
32GAR-00.5	9/4/02	13:50		380			41.7	3	
32GAR-00.5	9/19/02	13:50		590		380	1.31	2	
32GAR-00.5	10/16/02	14:35		77			38.7	1	

Table B-1. Walla Walla River basin TMDL bacteria-related parameters survey results.

Station ID	Date	Time	Replicate	FC #/100mL	Entero #/100mL	E. coli #/100mL	Chloride mg/L	TSS mg/L	TNVSS mg/L
32GAR-00.5	11/20/02	14:40		1600 J			26.5	14	
32GAR-00.5	1/15/03	13:40		11			12.6	13	
32GAR-00.5	3/12/03	13:15		44			10.5	17	
32GAR-00.5	4/8/03	14:15		56			9.6	26	
32GAR-00.5	4/23/03	14:40		160			8.71	30	
32GAR-00.5	5/7/03	15:00		100			8.05	15	
32GAR-00.5	5/28/03	15:30		240			10.7	8	
32GAR-00.5	6/11/03	14:40		1000			24.9	3	
32GAR-00.5	6/25/03	15:10		300			19.4	2	
32MIL-00.5	6/27/02	16:15		430		420	25.9	3	
32MIL-00.5	6/27/02	16:15	Y	370 J		300 J	25.8	3	
32MIL-00.5	7/11/02	9:50		900 J		600 J	34.4 J	2 J	
32MIL-00.5	7/11/02	9:50	Y	770 J		520 J	33.7 J	2 J	
32MIL-00.5	8/1/02	10:15		410 J		370 J	34.5	3	3
32MIL-00.5	8/1/02	10:15	Y	510 J		480 J	34.8	4	
32MIL-00.5	8/14/02	15:50	Y	1000		700	33.7	5	
32MIL-00.5	8/14/02	15:55		900		1100	34.5	6	
32MIL-00.5	9/4/02	15:40		200		250	42.9	1	1 U
32MIL-00.5	9/4/02	15:40	Y	170		250	45	1 U	
32MIL-00.5	9/19/02	15:50		600		450	46.3	1	
32MIL-00.5	9/19/02	15:50	Y	470 J		360 J	46.1	2	
32MIL-00.5	10/16/02	15:40		350		690	38.6	1 U	
32MIL-00.5	10/16/02	15:40	Y	510			40	2	
32MIL-00.5	11/20/02	15:15		45		44	26.5	2	
32MIL-00.5	11/20/02	15:15	Y	46			26.4	2	
32MIL-00.5	1/15/03	14:15		31		22	7.73	2	
32MIL-00.5	1/15/03	14:15	Y	20			7.74	2	
32MIL-00.5	3/12/03	14:55		22		27	1.66	44	
32MIL-00.5	3/12/03	14:55	Y	29			1.76	43	
32MIL-00.5	4/8/03	15:55		31		19	2.95	7	
32MIL-00.5	4/8/03	15:55	Y	33			2.96	7	
32MIL-00.5	4/23/03	17:00		23		13	5.55	5	4
32MIL-00.5	4/23/03	17:00	Y	15		21	5.54	5	
32MIL-00.5	5/7/03	16:10		49		57	2.97	7	
32MIL-00.5	5/7/03	16:10	Y	52			2.97	8	
32MIL-00.5	5/28/03	17:30		61		36	6.85	4	3
32MIL-00.5	5/28/03	17:30	Y	63		39	6.85	2	
32MIL-00.5	6/11/03	16:20		240		190	27.4	1	
32MIL-00.5	6/11/03	16:20	Y	260			27.4	1	
32MIL-00.5	6/25/03	17:05		440		200	35.7	3	2
32MIL-00.5	6/25/03	17:05	Y	220		350	35.7	3	
32MIL-02.8	6/27/02	15:30		140			28.1	2	
32MIL-02.8	7/11/02	10:55		77 J			37.9 J	1 J	
32MIL-02.8	8/1/02	10:55		57			49.2	3	
32MIL-02.8	8/14/02	15:25		190			49.4	7	
32MIL-02.8	9/4/02	15:10		96			50.6	5	
32MIL-02.8	9/19/02	15:00					48.5	2	
32MIL-02.8	10/16/02	15:10		51			41	2	
32MIL-02.8	11/20/02	15:45		26			26.7	1 U	

Table B-1. Walla Walla River basin TMDL bacteria-related parameters survey results.

Station ID	Date	Time	Replicate	FC #/100mL	Entero #/100mL	E. coli #/100mL	Chloride mg/L	TSS mg/L	TNVSS mg/L
32MIL-02.8	1/15/03	15:00		33			6.91	7	
32MIL-02.8	3/12/03	14:40		17			1.86	36	
32MIL-02.8	4/8/03	15:35		45			2.62	4	
32MIL-02.8	4/23/03	16:15		37			4.59	6	
32MIL-02.8	5/7/03	15:35		44			2.53	8	
32MIL-02.8	5/28/03	16:50		140			6.55	3	
32MIL-02.8	6/11/03	15:45		26			33.8	3	
32MIL-02.8	6/25/03	16:30		100 J			42.2	4	
32MIL-04.8	6/27/02	13:10		65		43	14.6	4	
32MIL-04.8	7/11/02	17:10		9 J		5 J	27.2 J	7 J	
32MIL-04.8	8/1/02	15:35		10		6	34	1	1
32MIL-04.8	8/14/02	14:15		66			37	3	
32MIL-04.8	9/4/02	14:20		4		2	41	2	1 U
32MIL-04.8	9/19/02	14:30		3		3	40.3	1	
32MIL-04.8	10/16/02	12:40		23			31.3	1 U	
32MIL-04.8	11/20/02	13:20		31			7.46	2	
32MIL-04.8	1/15/03	11:45		120			4.23	2	
32MIL-04.8	3/12/03	12:15		6			1.43	24	
32MIL-04.8	4/8/03	12:20		170			2.28	5	
32MIL-04.8	4/23/03	15:30		71		63	1.9	6	4
32MIL-04.8	5/7/03	12:40		63			1.09	8	
32MIL-04.8	5/28/03	16:10		84		82	2.25	2	1
32MIL-04.8	6/11/03	15:10		6			19.2	1	
32MIL-04.8	6/25/03	15:42		26 J		32	27.7	3	2
32MIL-06.7	6/27/02	12:30		1200 J		1000 J	2	4	
32MIL-06.7	7/11/02	15:40		1800 J			2.62 J	3 J	
32MIL-06.7	8/1/02	16:10		2500			4.74	6 J	
32MIL-06.7	8/14/02	13:50		4100		4200	3.69	11	5
32MIL-06.7	9/4/02	11:50		1600			4.98	3	
32MIL-06.7	9/19/02	12:40		1500		1200	4.8	2	
32MIL-06.7	10/16/02	11:40		1100		1600	4.43	2	
32MIL-06.7	11/20/02	12:00		230		230	2.88	1 U	
32MIL-06.7	1/15/03	10:45		330		270	1.28	7	
32MIL-06.7	3/12/03	10:30		3 U		8	0.59	23	
32MIL-06.7	4/8/03	12:00		48		41	0.74	6	
32MIL-06.7	4/23/03	12:10		76			0.92	7	
32MIL-06.7	5/7/03	11:50		130		140	0.62	7	
32MIL-06.7	5/28/03	13:15		220			0.87	5	
32MIL-06.7	6/11/03	12:55		890		700	5.17	2	
32MIL-06.7	6/25/03	12:20		1100			5.6	5	
32MIL-06.9	11/20/02	12:45		400					
32MIL-06.9	6/25/03	12:55		1100					
32MIL-07.0	6/25/03	12:50		1200					
32MIL-07.1	10/16/02	11:30		380	670	350	4.5		
32MIL-07.1	10/16/02	11:30	Y		680				
32MIL-07.1	11/20/02	12:40		220					
32MIL-07.2	6/25/03	12:45		760					
32MIL-07.3	10/16/02	11:05		360			4.41		
32MIL-07.4	10/16/02	10:40		220	220	160	4.26		

Table B-1. Walla Walla River basin TMDL bacteria-related parameters survey results.

Station ID	Date	Time	Replicate	FC #/100mL	Entero #/100mL	E. coli #/100mL	Chloride mg/L	TSS mg/L	TNVSS mg/L
32MIL-08.5	6/27/02	11:35		360 J			0.54	2	
32MIL-08.5	8/1/02	17:15		700			0.29	1 U	
32MIL-08.5	4/23/03	11:25		76			0.63	5	
32MIL-08.5	5/28/03	12:00		290			0.6	4	
32MIL-11.5	6/27/02	10:50		57			0.66	4	
32MIL-11.5	7/11/02	14:40		10 J			0.77 J	2 J	
32MIL-11.5	8/1/02	17:40		13			0.88	2	
32MIL-11.5	8/14/02	12:25		17			0.85	4	
32MIL-11.5	9/4/02	10:40		20			0.88	3	
32MIL-11.5	9/19/02	11:40					0.93	3	
32MIL-11.5	10/16/02	10:10		12			0.97	1	
32MIL-11.5	11/20/02	10:50		2			1.14	3	
32MIL-11.5	1/15/03	10:15		5			0.98	2	
32MIL-11.5	3/12/03	9:50		8			0.54	20	
32MIL-11.5	4/8/03	11:00		1			0.62	5	
32MIL-11.5	4/23/03	10:45		1			0.62	12	
32MIL-11.5	5/7/03	10:50		2			0.49	4	
32MIL-11.5	5/28/03	11:40		8			0.56	3	
32MIL-11.5	6/11/03	11:35		12			0.67	2	
32MIL-11.5	6/25/03	10:45		8			0.79	2	
32MIL-12.8	8/1/02	18:15		85			0.85	3	
32MIL-12.8	9/4/02	10:00		120			0.88	4	
32MIL-12.8	4/23/03	10:20		3			0.61	3	
32MIL-12.8	5/28/03	11:10		14			0.54	5	
32MIL-12.8	6/25/03	10:15		27			0.78	3	
32MIL-21.1	6/27/02	9:30		29		23	0.62	1	
32MIL-21.1	7/11/02	13:10		15 J		16 J	0.77 J	1 J	
32MIL-21.1	8/1/02	19:10		8		20	0.81	1 U	
32MIL-21.1	8/1/02	19:10	Y	14			0.77		
32MIL-21.1	8/14/02	11:10		8		10	0.78	1 U	
32MIL-21.1	9/4/02	9:30		9		15	0.77	1 U	
32MIL-21.1	9/4/02	9:30	Y	9			3.15	1 U	
32MIL-21.1	9/19/02	10:15		11 J		9 J	0.82	1 U	
32MIL-21.1	10/16/02	9:20		1 UJ		2 J	0.86	1 U	
32MIL-21.1	11/20/02	10:15		5		5	0.89	1 U	
32MIL-21.1	1/15/03	9:15		1 U		2	0.69	1 U	
32MIL-21.1	3/12/03	9:10		4		4	0.44	5	
32MIL-21.1	4/8/03	9:45		1		1	0.46	1	
32MIL-21.1	4/23/03	8:55		1 J		1	0.47	1 U	
32MIL-21.1	4/23/03	8:55	Y	1 U			0.46		
32MIL-21.1	5/7/03	10:00		3		1 U	0.4	1	
32MIL-21.1	5/28/03	10:30		1 J		2 J	0.47	2	
32MIL-21.1	5/28/03	10:30	Y	7 J			0.47		
32MIL-21.1	6/11/03	10:50		12		13	0.7	1	
32MIL-21.1	6/25/03	9:26		21		26	0.69	1 U	
32MIL-21.1	6/25/03	9:26	Y	22			0.67		
32MIL-PIPE	11/20/02	12:45		1 U					
32MUD-00.5	7/31/02	12:20		180			4.85	9	
32MUD-00.5	9/5/02	11:20		160			8.64	13	

Table B-1. Walla Walla River basin TMDL bacteria-related parameters survey results.

Station ID	Date	Time	Replicate	FC #/100mL	Entero #/100mL	E. coli #/100mL	Chloride mg/L	TSS mg/L	TNVSS mg/L
32MUD-00.5	4/24/03	13:35		320			10.6	15	
32MUD-00.5	5/29/03	12:20		420			12.4	5	
32NFT-00.0	6/25/02	10:25		22 J		19 J	0.4	4	
32NFT-00.0	7/9/02	11:25		38		37	0.47	4	
32NFT-00.0	7/30/02	11:45		39		18	0.46	4	
32NFT-00.0	8/13/02	8:56		20		30	0.46	2	
32NFT-00.0	9/3/02	9:45		31		31	0.62	3	
32NFT-00.0	9/17/02	9:10		80		66	0.6	4	
32NFT-00.0	10/15/02	10:00		9		14	0.47	2	
32NFT-00.0	11/19/02	9:30		14		15	0.57	2	
32NFT-00.0	1/14/03	10:10		9		5	0.6	2	
32NFT-00.0	3/11/03	9:20		5		10	0.68	36	
32NFT-00.0	4/7/03	9:22		2		2	0.59	2	
32NFT-00.0	4/21/03	9:50		39 J		36 J	0.53	4	
32NFT-00.0	5/6/03	12:05		1		2	0.47	3	
32NFT-00.0	5/26/03	10:25		11		17	0.41	7	
32NFT-00.0	6/10/03	10:45		14		12	0.43	3	
32NFT-00.0	6/23/03	10:30		24		18	0.44	2	
32PAT-00.1	7/30/02	13:05		43			31.6	1	1 U
32PAT-00.1	9/3/02	11:40		36			43.2	1	1 U
32PAT-00.1	4/21/03	12:55		1			2.97	3	2
32PAT-00.1	5/26/03	11:10		92			10.1	5	3
32PAT-00.1	6/23/03	12:00		1300 J			21.3	3	2
32PIN-01.4	7/31/02	12:10		51			113	5	
32PIN-01.4	4/24/03	12:55		240			12	5	
32PIN-01.4	5/29/03	13:00		110			15.3	9	
32PIN-01.4	6/26/03	14:25		120			53	16	
32RUS-00.1	8/1/02	12:45		400			2.71	9	
32RUS-00.1	9/4/02	12:45		500			2.2	16	
32RUS-00.1	4/23/03	13:20		150			6.54	20	
32RUS-00.1	5/28/03	13:50		240			9.27	8	
32RUS-00.1	6/25/03	13:50		430			12.1	9	
32SFT-00.0	6/25/02	10:45		16		17	0.37	1	
32SFT-00.0	7/9/02	12:00		19		26	0.36	1 U	
32SFT-00.0	7/30/02	11:55		16		13	0.5	2	
32SFT-00.0	7/30/02	11:55	Y	9			0.51	2	
32SFT-00.0	8/13/02	9:10		14		25	0.54	1 U	
32SFT-00.0	9/3/02	9:50		7		5	0.55	6	
32SFT-00.0	9/3/02	9:50	Y	7			0.57	3	
32SFT-00.0	9/17/02	9:30		19			0.62	3	
32SFT-00.0	10/15/02	10:30		3			0.48	1	
32SFT-00.0	11/19/02	10:00		27			0.93	1 U	
32SFT-00.0	1/14/03	10:30		10			0.78	1	
32SFT-00.0	4/21/03	10:25		3 J		1 J	0.49	2	
32SFT-00.0	4/21/03	10:25	Y	2 J			0.51	2	
32SFT-00.0	5/6/03	11:55		1 U			0.43	3	
32SFT-00.0	5/26/03	10:10		7		6	0.37	3	
32SFT-00.0	5/26/03	10:10	Y	7			0.38	2	
32SFT-00.0	6/10/03	10:30		31			0.47	1	

Table B-1. Walla Walla River basin TMDL bacteria-related parameters survey results.

Station ID	Date	Time	Replicate	FC #/100mL	Entero #/100mL	E. coli #/100mL	Chloride mg/L	TSS mg/L	TNVSS mg/L
32SFT-00.0	6/23/03	10:15		7 J		9 J	0.56	1	
32SFT-00.0	6/23/03	10:15	Y	11 J			0.54	1	
32TOU-00.5	6/25/02	17:00		410 J		330 J	1.22	9	8
32TOU-00.5	6/25/02	17:00	Y	1600 J		1600 J	1.24	9	
32TOU-00.5	7/9/02	17:50		300		340	1.72	10	9
32TOU-00.5	7/9/02	17:50	Y	410		370	1.71	10	
32TOU-00.5	7/29/02	16:45		300		300	2.27	5	4
32TOU-00.5	7/29/02	16:45	Y	300		240	2.28	5	4
32TOU-00.5	8/13/02	14:50		290		200	2.81	3	3
32TOU-00.5	8/13/02	14:50	Y	120		92	2.79	3	
32TOU-00.5	9/2/02	13:10		140		150	3.35	4	3
32TOU-00.5	9/2/02	13:10	Y	140		180	3.3	4	3
32TOU-00.5	9/17/02	17:15		26		26	3.13	1	1
32TOU-00.5	9/17/02	17:15	Y	34		29	2.89	2	
32TOU-00.5	10/15/02	15:15		5		6	1.88	2	2
32TOU-00.5	10/15/02	15:15	Y	6		3	1.89	2	
32TOU-00.5	11/19/02	15:35		88		78	1.82	2	2
32TOU-00.5	11/19/02	15:35	Y	79		82	1.82	3	
32TOU-00.5	1/14/03	16:15		20		7	1.46	10	9
32TOU-00.5	1/14/03	16:15	Y	19		7	1.5	10	
32TOU-00.5	3/11/03	13:30		96		120	0.85	953 J	900 J
32TOU-00.5	3/11/03	13:30	Y	120		100	0.84	871 J	
32TOU-00.5	4/7/03	15:20		11		6	1.13	83	79
32TOU-00.5	4/7/03	15:20	Y	5		9	1.13	86	
32TOU-00.5	4/22/03	15:10		40		36	1.51	34	31 J
32TOU-00.5	4/22/03	15:10	Y	29		44	1.51	34	31 J
32TOU-00.5	5/6/03	17:25		12		13	1.28	24	21
32TOU-00.5	5/27/03	14:58		59		50	1.51	11	9
32TOU-00.5	5/27/03	14:58	Y	61		55	1.51	11	10
32TOU-00.5	6/10/03	17:05		340		190	2.21	14	13
32TOU-00.5	6/24/03	16:30		840 J		880 J	2.22	7	7
32TOU-00.5	6/24/03	16:30	Y	720 J		720 J	2.22	7	6
32TOU-02.0	6/25/02	16:35		290 J			1.17	6	
32TOU-02.0	7/9/02	16:40		230			1.51	4	
32TOU-02.0	7/29/02	16:00		1800 J			1.93	3	3
32TOU-02.0	8/13/02	14:00		62			1.99	2	
32TOU-02.0	9/2/02	12:45		160			3.76	2	2
32TOU-02.0	9/17/02	16:55		72			1.9	2	
32TOU-02.0	10/15/02	14:55		26			1.5	1 U	
32TOU-02.0	11/19/02	15:15		120			1.61	2	
32TOU-02.0	4/22/03	14:40		31			1.45	24	22 J
32TOU-02.0	5/27/03	14:25		47			1.44	15	14
32TOU-02.0	6/24/03	16:05		360			1.86	5	4
32TOU-07.0	6/25/02	16:20		71		64	1.17	6	5
32TOU-07.0	7/9/02	17:15		74		96	1.52	3	3
32TOU-07.0	7/29/02	15:05		61		51	1.73	1	1 U
32TOU-07.0	8/13/02	13:35		49		44	1.79	1	1 U
32TOU-07.0	9/2/02	12:20		84		81	1.99	2	1
32TOU-07.0	9/17/02	16:35		220		170	1.7	2	2

Table B-1. Walla Walla River basin TMDL bacteria-related parameters survey results.

Station ID	Date	Time	Replicate	FC #/100mL	Entero #/100mL	E. coli #/100mL	Chloride mg/L	TSS mg/L	TNVSS mg/L
32TOU-07.0	10/15/02	14:35		26		31	1.42	2	1
32TOU-07.0	11/19/02	14:50		32		27	1.57	2	2
32TOU-07.0	1/14/03	15:45		17		9	1.6	9	9
32TOU-07.0	3/11/03	13:05		57			0.85	843 J	791 J
32TOU-07.0	4/7/03	14:50		4		6	1.14	68	65
32TOU-07.0	4/22/03	14:15		37		50	1.45	23	21 J
32TOU-07.0	5/6/03	17:10		4			1.26	14	12
32TOU-07.0	5/27/03	14:00		18		16	1.34	5	4
32TOU-07.0	6/10/03	16:35		40			1.82	5	4
32TOU-07.0	6/24/03	14:45		32		43	1.68	2	2
32TOU-14.2	7/29/02	14:20		47			1.65	1	
32TOU-14.2	9/2/02	11:55		31			1.85	1	
32TOU-14.2	4/22/03	14:00		79			1.48	23	
32TOU-14.2	5/27/03	13:35		19			1.26	7	
32TOU-14.2	6/24/03	15:35		15			1.7	2	
32TOU-17.8	6/25/02	15:35		210 J			1.16	4	
32TOU-17.8	7/9/02	16:00		43			1.71	4	
32TOU-17.8	7/29/02	13:35		33			1.61	2	2
32TOU-17.8	8/13/02	12:00		27			1.7	2	
32TOU-17.8	9/2/02	11:15		14			1.78	2	1 U
32TOU-17.8	9/17/02	14:50		39			1.57	2	
32TOU-17.8	10/15/02	13:40		4			1.43	1	
32TOU-17.8	11/19/02	14:05		5			1.54	2	
32TOU-17.8	1/14/03	15:05		19			1.66	7	
32TOU-17.8	3/11/03	12:35		51			0.85	673 J	
32TOU-17.8	4/7/03	13:30		9			1.14	49	
32TOU-17.8	4/22/03	13:30		230 J			1.47	19	17 J
32TOU-17.8	5/6/03	16:40		5			1.31	12	
32TOU-17.8	5/27/03	12:35		36			1.29	6	5
32TOU-17.8	6/10/03	16:10		83			1.8	7	
32TOU-17.8	6/24/03	14:00		61			1.72	3	2
32TOU-25.0	7/29/02	12:50		43			1.57	2	
32TOU-25.0	9/2/02	10:35		39			1.6	2	
32TOU-25.0	4/22/03	12:15		120			1.5	25	
32TOU-25.0	5/27/03	12:00		28			1.27	12	
32TOU-25.0	6/24/03	13:07		210 J			1.69	4	
32TOU-30.6	7/29/02	11:15		130			1.49	3	
32TOU-30.6	9/2/02	10:10		340			1.57	3	
32TOU-30.6	4/22/03	11:45		53			1.4	11	
32TOU-30.6	5/27/03	11:30		55			1.21	15	
32TOU-30.6	6/24/03	12:42		140			1.59	4	
32TOU-34.2	6/25/02	14:45		41		43	1.12	4	
32TOU-34.2	7/9/02	15:13		31		31	1.94	4	
32TOU-34.2	7/29/02	12:00		190		240	1.46	3	2
32TOU-34.2	8/13/02	11:20		250		250	1.56	3	
32TOU-34.2	9/2/02	9:25		780		710	1.49	3	3
32TOU-34.2	9/17/02	12:20		740		660	1.57	4	
32TOU-34.2	10/15/02	12:50		23		15	1.29	2	
32TOU-34.2	11/19/02	13:05		20		16	1.47	3	

Table B-1. Walla Walla River basin TMDL bacteria-related parameters survey results.

Station ID	Date	Time	Replicate	FC #/100mL	Entero #/100mL	E. coli #/100mL	Chloride mg/L	TSS mg/L	TNVSS mg/L
32TOU-34.2	1/14/03	14:05		12		2	1.38	5	
32TOU-34.2	3/11/03	11:55		60		17	0.87	303 J	
32TOU-34.2	4/7/03	12:40		9		9	1.06	9	
32TOU-34.2	4/22/03	10:45		81		63	1.36	6	4 J
32TOU-34.2	5/6/03	15:45		6		7	1.2	7	
32TOU-34.2	5/27/03	10:48		54		73	1.22	14	12
32TOU-34.2	6/10/03	15:00		27		10	1.66	6	
32TOU-34.2	6/24/03	12:05		55		59	1.58	5	4
32TOU-36.6	7/29/02	10:00		1100 J			1.47	3	
32TOU-36.6	9/2/02	9:10		1100 J			1.49	4	
32TOU-36.6	4/22/03	10:30		100			1.34	3	
32TOU-36.6	5/27/03	9:55		84			1.17	10	
32TOU-36.6	6/24/03	11:30		110			1.58	3	
32TOU-40.5	6/25/02	13:30		40			1.04	4	
32TOU-40.5	7/9/02	14:30		37			1.62	3	
32TOU-40.5	7/29/02	9:11		150			1.46	3	
32TOU-40.5	7/30/02	15:45		88			1.49	4	
32TOU-40.5	8/13/02	11:00		23			1.63	4	
32TOU-40.5	9/2/02	8:45		140			1.46	4	
32TOU-40.5	9/3/02	13:50		5			1.46	3	
32TOU-40.5	9/17/02	11:55		100			1.46	4	
32TOU-40.5	10/15/02	12:20		8			1.22	2	
32TOU-40.5	11/19/02	12:30		7			1.37	2	
32TOU-40.5	1/14/03	13:30		8			1.27	5	
32TOU-40.5	3/11/03	11:35		31			0.85	151	
32TOU-40.5	4/7/03	12:20		4			1.03	6	
32TOU-40.5	4/21/03	15:30		2			1.33	5	
32TOU-40.5	4/22/03	9:25		18			1.29	5	
32TOU-40.5	5/6/03	14:30		5			1.22	5	
32TOU-40.5	5/26/03	14:45		32			2.8	10	
32TOU-40.5	5/27/03	9:05		36			1.12	7	
32TOU-40.5	6/10/03	14:25		14			1.69	4	
32TOU-40.5	6/23/03	14:10		31			1.42	5	
32TOU-40.5	6/24/03	10:30		46 J			1.49	4	
32TOU-44.2	7/30/02	14:45		43			1.21	4	
32TOU-44.2	9/3/02	13:15		27			1.19	3	
32TOU-44.2	4/21/03	14:30		1			1.28	3	
32TOU-44.2	5/26/03	13:45		39			1.01	7	
32TOU-44.2	6/23/03	13:30		25			1.18	4	
32TOU-46.2	6/25/02	12:45		23		23	0.9	2	
32TOU-46.2	7/9/02	13:45		46		32	1.47	3	
32TOU-46.2	7/30/02	14:20		31		31	1.15	4	
32TOU-46.2	8/13/02	10:20		32			1.25	4	
32TOU-46.2	9/3/02	12:40		21		18	1.15	4	
32TOU-46.2	9/17/02	11:15		86			1.19	5	
32TOU-46.2	10/15/02	11:45		11			0.96	2	
32TOU-46.2	11/19/02	11:55		3			1.08	3	
32TOU-46.2	1/14/03	13:10		6			1.13	3	
32TOU-46.2	3/11/03	11:10		34			0.83	108	

Table B-1. Walla Walla River basin TMDL bacteria-related parameters survey results.

Station ID	Date	Time	Replicate	FC #/100mL	Entero #/100mL	E. coli #/100mL	Chloride mg/L	TSS mg/L	TNVSS mg/L
32TOU-46.2	4/7/03	11:50		2			0.96	3	
32TOU-46.2	4/21/03	13:40		1		1	1.23	3	
32TOU-46.2	5/6/03	14:00		5			1.15	6	
32TOU-46.2	5/26/03	13:25		27		21	1	6	
32TOU-46.2	6/10/03	13:45		33			1.33	3	
32TOU-46.2	6/23/03	12:45		13		11	1.12	3	
32TOU-48.4	7/30/02	13:55		14			1.25	5	
32TOU-48.4	9/3/02	12:20		15			1.08	4	
32TOU-48.4	4/21/03	13:20		8			1.13	2	
32TOU-48.4	5/26/03	13:00		13			0.97	5	
32TOU-48.4	6/23/03	12:25		5			1.16	3	
32TOU-51.2	6/25/02	12:10		20			0.9	2	
32TOU-51.2	7/9/02	13:00		11			1.73	3	
32TOU-51.2	7/30/02	13:35		34			1.2	4	
32TOU-51.2	8/13/02	10:05		38			1.35	4	
32TOU-51.2	9/3/02	12:00		33			1.22	4	
32TOU-51.2	9/17/02	10:35		270 J			1.24	4	
32TOU-51.2	10/15/02	11:25		63			1.02	2	
32TOU-51.2	11/19/02	11:20		12			1.81	2	
32TOU-51.2	1/14/03	12:30		5			1.1	2	
32TOU-51.2	3/11/03	10:55		17			0.78	93	
32TOU-51.2	4/7/03	11:30		1			0.88	4	
32TOU-51.2	4/21/03	11:10		1 J			1.16	5	
32TOU-51.2	5/6/03	13:10		1			1.14	4	
32TOU-51.2	5/26/03	12:25		12			0.95	5	
32TOU-51.2	6/10/03	13:05		11			1.32	3	
32TOU-51.2	6/23/03	11:00		15			1.16	2	
32TOU-53.9	7/30/02	12:45		25			0.49	3	
32TOU-53.9	9/3/02	11:15		19			0.43	2	
32TOU-53.9	10/15/02	10:50					0.47		
32TOU-53.9	4/7/03	9:41		4			0.58	1	
32TOU-53.9	4/21/03	10:50		28 J			0.52	1	
32TOU-53.9	5/26/03	10:50		10			0.42	6	
32TOU-53.9	6/23/03	9:38		17 J			0.44	1	
32WAL-09.3	6/26/02	15:00		73		47	7.51	11	10
32WAL-09.3	6/26/02	15:00	Y	64		59	7.5	11	10
32WAL-09.3	7/10/02	17:00		44		43	11.6	10	8
32WAL-09.3	7/10/02	17:00	Y	61		49	11.6	10	9
32WAL-09.3	7/31/02	10:05		100		100	17.9	12	11
32WAL-09.3	7/31/02	10:05	Y	100		100	18	12	
32WAL-09.3	8/15/02	10:30		260 J		310 J	18.3	15	13
32WAL-09.3	8/15/02	10:35	Y	270 J		250 J	18.4	8	7
32WAL-09.3	9/5/02	13:15		96		100	27.9	11	9
32WAL-09.3	9/5/02	13:15	Y	120		96	27.7	12	
32WAL-09.3	9/18/02	15:20		29		31	14.9	3	3
32WAL-09.3	9/18/02	15:20	Y	26		20	14.9	3	3
32WAL-09.3	10/17/02	13:10		17		33	12.3	3	3
32WAL-09.3	10/17/02	13:10	Y	18		17	12.4	4	3
32WAL-09.3	11/21/02	13:15		4		5	10.2	5	5

Table B-1. Walla Walla River basin TMDL bacteria-related parameters survey results.

Station ID	Date	Time	Replicate	FC #/100mL	Entero #/100mL	E. coli #/100mL	Chloride mg/L	TSS mg/L	TNVSS mg/L
32WAL-09.3	11/21/02	13:15	Y	7		6	10.1	5	5
32WAL-09.3	1/16/03	14:40		8		10	4.51	16	14
32WAL-09.3	1/16/03	14:40	Y	14		7	4.54	16	14
32WAL-09.3	3/13/03	11:30		35		92	1.39	574 J	545 J
32WAL-09.3	3/13/03	11:30	Y	57		51	1.39	529 J	503 J
32WAL-09.3	4/9/03	12:00		48			2.57	106	100
32WAL-09.3	4/9/03	12:00	Y	39		40	2.58	94	88
32WAL-09.3	4/24/03	14:40		27		53	4.24	31	29 J
32WAL-09.3	4/24/03	14:40	Y	51		38	4.24	33	
32WAL-09.3	5/8/03	12:20		28 J		31 J	3.32	27	25
32WAL-09.3	5/8/03	12:20	Y	11 J		35 J	3.29	25	23
32WAL-09.3	5/29/03	17:25		53		60	5.78	22	21
32WAL-09.3	5/29/03	17:25	Y	36		52	5.74	23	
32WAL-09.3	6/12/03	13:52		160		480 J	15.1	16	11
32WAL-09.3	6/12/03	13:52	Y	97		630 J	15	18	13
32WAL-09.3	6/26/03	16:50		23		14	14.2	11	9
32WAL-09.3	6/26/03	16:50	Y	17		20	14.2	11	
32WAL-12.0	7/31/02	10:30		43			15.9	9	
32WAL-12.0	9/5/02	13:00		28			23.9	8	
32WAL-12.0	3/13/03	11:10		40			1.38	533 J	
32WAL-12.0	4/24/03	14:25		39			4.11	12	
32WAL-12.0	6/26/03	16:30		22			13.8	12	
32WAL-15.6	6/26/02	14:00		300		370	7.04	13	
32WAL-15.6	7/10/02	15:45		120		80	10.8	16	
32WAL-15.6	7/31/02	10:55		120		120	14.1	9	8
32WAL-15.6	8/15/02	11:20		49			20.8	3	
32WAL-15.6	9/5/02	12:30		37		60	23.7	5	3
32WAL-15.6	9/18/02	14:45		52			13.2	7	
32WAL-15.6	10/17/02	12:30		410			9.62	9	
32WAL-15.6	11/21/02	12:45		11			9.77	8	
32WAL-15.6	1/16/03	14:00		20			4.45	11	
32WAL-15.6	4/9/03	11:30		69			2.43	102	
32WAL-15.6	4/24/03	14:05		43		100	3.86	18	17
32WAL-15.6	5/8/03	11:55		27 J			3.22	17	
32WAL-15.6	5/29/03	17:00		54		60	5.12	15	14
32WAL-15.6	6/12/03	13:25		240			12.4	16	
32WAL-15.6	6/26/03	16:00		80		83	13.7	14	12
32WAL-22.7	6/26/02	16:15		890 J		1000 J	16	11	10
32WAL-22.7	7/10/02	15:10		540		380	14	16	14
32WAL-22.7	7/31/02	11:50		1300		800	18.1	7	6
32WAL-22.7	8/15/02	12:05		120		110	16.5	1	1 U
32WAL-22.7	9/5/02	11:47		69		54	13.2	2	2
32WAL-22.7	9/18/02	13:40		160		170	7.83	3	3
32WAL-22.7	10/17/02	11:45		3 U		9	13.7	1	1 U
32WAL-22.7	11/21/02	12:15		6		1 U	14.3	1	1 U
32WAL-22.7	1/16/03	13:35		32		29	5.35	11	10
32WAL-22.7	3/13/03	10:20		43		110	1.68	330 J	312 J
32WAL-22.7	4/9/03	11:00		80		110	2.71	63	59
32WAL-22.7	4/24/03	12:35		69		75	4	13	11

Table B-1. Walla Walla River basin TMDL bacteria-related parameters survey results.

Station ID	Date	Time	Replicate	FC #/100mL	Entero #/100mL	E. coli #/100mL	Chloride mg/L	TSS mg/L	TNVSS mg/L
32WAL-22.7	5/8/03	10:30		52 J		57 J	3.48	12	11
32WAL-22.7	5/29/03	13:20		88		88	6.36	31	28
32WAL-22.7	6/12/03	12:55		230		510 J	16.9	8	7
32WAL-22.7	6/26/03	15:05		410		300	15.4	10	9
32WAL-27.4	6/26/02	12:20		80			9.34	3	3
32WAL-27.4	7/10/02	14:30		120			9.55	2	2
32WAL-27.4	7/31/02	13:15		20			5.78	1 U	1 U
32WAL-27.4	8/15/02	12:35		16			6.72	1 U	1 U
32WAL-27.4	9/5/02	10:50		49			4.8	1	1 U
32WAL-27.4	9/18/02	12:25		87			3.98	3	3
32WAL-27.4	10/17/02	10:50		6			9.01	1 U	1 U
32WAL-27.4	11/21/02	11:35		4			13	1 U	1 U
32WAL-27.4	1/16/03	12:50		12			3.85	13	12
32WAL-27.4	3/13/03	10:00		41			1.29	238 J	221 J
32WAL-27.4	4/9/03	10:35		53			2.18	17	15
32WAL-27.4	4/24/03	12:00		40			2.88	6	4
32WAL-27.4	5/8/03	10:15		21 J			2.58	5	5
32WAL-27.4	5/29/03	12:05		33			4.42	8	7
32WAL-27.4	6/12/03	12:25		71			9.82	6	5
32WAL-27.4	6/26/03	13:55		130			8.31	5	4
32WAL-29.3	6/26/02	11:45		49			8.75	4	
32WAL-29.3	7/10/02	13:45		43			9.29	4	
32WAL-29.3	7/31/02	13:50		84			3.85	4	
32WAL-29.3	8/15/02	12:55		5			4.22	3	
32WAL-29.3	9/5/02	9:55		47 J			3.83	2	
32WAL-29.3	9/18/02	11:10		340 J			3.65	6	
32WAL-29.3	10/17/02	10:20		23			8.2	1	
32WAL-29.3	11/21/02	11:00		14			12.6	1	
32WAL-29.3	1/16/03	12:30		21			3.73	5	
32WAL-29.3	3/13/03	9:45		41 J			1.31	176	
32WAL-29.3	4/9/03	10:20		47 J			2.39	13	
32WAL-29.3	4/24/03	11:25		31			3.05	6	
32WAL-29.3	5/8/03	10:05		28 J			2.77	5	
32WAL-29.3	5/29/03	11:20		69			4.27	8	
32WAL-29.3	6/12/03	11:30		36			7.95	7	
32WAL-29.3	6/26/03	13:16		23			7.15	7	
32WAL-32.8	6/26/02	11:00		140		100	8.18	5	
32WAL-32.8	7/10/02	12:55		220		180	7.74	7	
32WAL-32.8	7/31/02	14:15		420		240	2.5	7	6
32WAL-32.8	10/17/02	9:55		66		46	7.86	1	
32WAL-32.8	11/21/02	10:25		28		21	12	1	
32WAL-32.8	1/16/03	10:20		25		28	3.55	5	
32WAL-32.8	3/13/03	9:35		87 J			1.33	161	
32WAL-32.8	4/9/03	10:10		110 J		100 J	2.24	13	
32WAL-32.8	4/24/03	11:05		65		44	2.9	6	6
32WAL-32.8	5/8/03	9:50		44 J			2.85	5	
32WAL-32.8	5/29/03	10:40		81		70	3.45	6	4
32WAL-32.8	6/12/03	10:55		84			6.71	5	
32WAL-32.8	6/26/03	12:35		88		88	6.41	5	4

Table B-1. Walla Walla River basin TMDL bacteria-related parameters survey results.

Station ID	Date	Time	Replicate	FC #/100mL	Entero #/100mL	E. coli #/100mL	Chloride mg/L	TSS mg/L	TNVSS mg/L
32WAL-34.0	9/5/02	9:40		150 J		140 J	2.51	5	4
32WAL-34.0	9/18/02	10:45		130 J		230	1.92	6	
32WAL-35.2	7/31/02	15:00		250			2.01	9	
32WAL-35.2	8/15/02	13:30		84		140	2.25	12	
32WAL-35.2	9/5/02	9:15		210 J			2.39	5	
32WAL-35.2	4/24/03	9:50		97			1.52	10	
32WAL-35.2	5/29/03	9:30		200			1.83	12	
32WAL-38.7	6/26/02	9:30		260 J		260 J	1.57	2	
32WAL-38.7	7/10/02	11:30		96		140	1.87	2	
32WAL-38.7	7/31/02	15:45		28		17	1.83	2	
32WAL-38.7	7/31/02	15:45	Y	31			1.86	2	
32WAL-38.7	8/15/02	15:05		90		63	1.71	7	
32WAL-38.7	9/5/02	8:40		120 J		130 J	1.46	3	
32WAL-38.7	9/5/02	8:40	Y	140 J			1.49	3	
32WAL-38.7	9/18/02	8:45		100		110	1.37	3	
32WAL-38.7	10/17/02	9:25		45		64	1.62	2	
32WAL-38.7	11/21/02	9:15		31		36	1.68	1	
32WAL-38.7	1/16/03	9:20		16			0.98	3	
32WAL-38.7	3/13/03	9:05		92 J		40 J	0.56	188	
32WAL-38.7	4/9/03	9:45		23		18	0.65	6	
32WAL-38.7	4/24/03	9:15		10		14	0.64	4	
32WAL-38.7	4/24/03	9:15	Y	14			0.63	3	
32WAL-38.7	5/8/03	9:20		20 J		18 J	0.66	3	
32WAL-38.7	5/29/03	8:45		36 J		31 J	0.68	7	6
32WAL-38.7	5/29/03	8:45	Y	19 J			0.63	3	
32WAL-38.7	6/12/03	9:35		96		70 J	2.21	2	
32WAL-38.7	6/26/03	10:15		110 J		96 J	2.54	2	
32WAL-38.7	6/26/03	10:15	Y				2.54	1	
32WAL-WWTP	12/2/02	14:50		6		2			
32WAL-WWTP	12/2/02	15:45					23.9	1 U	1 U
32WAL-WWTP	12/3/02	15:30		1 U		2 U			
32WAL-WWTP	12/3/02	15:30	Y	1 U		1		1	
32WAL-WWTP	1/16/03	11:00		6		1 U	21.5	1 U	1 U
32WAL-WWTP	2/24/03	10:30					20.3	1 U	
32WAL-WWTP	2/25/03	15:55		110		4			
32WAL-WWTP	3/12/03	11:50		17		17	22.4	1 U	
32WAL-WWTP	4/8/03	12:50		51		6	22.2	1 U	
32WLW-00.8	4/24/03	10:10		160			3.24	15	
32WLW-00.8	5/29/03	9:45		260			3.6	6	
32WLW-00.8	6/26/03	11:42		150			6.25		
32YEL-00.2	6/26/02	10:00		300 J			1.41	27	
32YEL-00.2	7/11/02	16:05		200 J			1.77 J	14 J	
32YEL-00.2	8/1/02	13:50		120			1.48	9	8
32YEL-00.2	8/14/02	15:05		190			1.65	6	
32YEL-00.2	9/4/02	13:25		210			1.28	8	6
32YEL-00.2	9/19/02	13:20		150		150	45	8	
32YEL-00.2	10/16/02	13:50		84			1.63	2	
32YEL-00.2	11/20/02	14:00		190			1.81	3	
32YEL-00.2	1/15/03	12:15		240			2.5	7	

Table B-1. Walla Walla River basin TMDL bacteria-related parameters survey results.

Station ID	Date	Time	Replicate	FC #/100mL	Entero #/100mL	E. coli #/100mL	Chloride mg/L	TSS mg/L	TNVSS mg/L
32YEL-00.2	3/12/03	13:55		100			1.49	58	
32YEL-00.2	4/8/03	13:25		54			1.72	32	
32YEL-00.2	4/23/03	14:00		240			2.38	19	
32YEL-00.2	5/7/03	13:45		220			1.88	25	
32YEL-00.2	5/28/03	14:55		260			2.18	27	23
32YEL-00.2	6/11/03	13:40		170			1.87	30	
32YEL-00.2	6/25/03	14:45		260			1.64	19	17
32YEL-03.5	9/4/02	12:15		150			1.01	15	

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Table B-2. Results for nutrient and pH-related parameters for the Walla Walla River basin TMDL. Bold type indicates periphyton chlorophyll a data.

Station ID	Date	Time	Rep-licate	Alkalinity mg/L	Chlor. a ug/L	BOD mg/L	TPN mg/L	NO2/NO3 mg/L	NH3 mg/L	TP mg/L	Ortho-phos mg/L	TOC mg/L	DOC mg/L	Comments
32COL-GARR	8/1/02	15:00			81.6	5	3.31	0.772	1.32	3.06	3.41			
32COL-GARR	9/11/02	15:00		158		4 U	2.17	1.41 J	0.16	3.48	3.35	6.4	5.7	
32COL-GARR	9/11/02	15:00	Y			4 U								
32COL-GARR	9/11/02	9:30		157		4 U	2.23	1.46 J	0.172	3.41	3.46	5.7	5.5	
32COL-WWTP	12/2/02	9:15		105		9	1.73	0.761	0.282	0.603	0.357	7.4	7	
32COL-WWTP	1/15/03	13:05		103		2	2.36	1.6	0.076	2.63	2.29	6.8	6.7	
32COL-WWTP	2/24/03	8:40		106		3 U	5.95	5.49	0.04	3.44	3.63	4.9	4.3	
32COL-WWTP	3/12/03	12:50		108		4 U	3.11	2.59	0.048	2.66	2.49	4.2	3.9	
32COL-WWTP	3/12/03	12:50	Y			4 U								
32COL-WWTP	4/8/03	14:50		108		4 U	5.96	4.99	0.029	3.06	3.15	4.3	4.3	
32COL-WWTP	4/8/03	14:50	Y			4 U								
32COL-WWTP	5/7/03	14:15		121		2 U	5.39	5.27	0.053	3.3	3.24	4.6	3.7	
32COL-WWTP	6/11/03	14:10		132		17 J	9.41	8.65	0.077	4.06	3.73	6.9	4.4	
32COP-00.5	7/30/02	15:20			2.1		0.672	0.44	0.04	0.118	0.079			
32COP-00.5	9/3/02	13:25			1.8 J		0.627	0.469 J	0.023	0.124	0.0685			
32COP-00.5	4/21/03	14:45			12.2		1.49	1.36	0.01 U	0.199	0.023			
32COP-00.5	5/26/03	14:00			6.6		1.57	1.39	0.03	0.123	0.0676			
32COP-00.5	6/23/03	13:46			2.3		0.994	0.826	0.021	0.09	0.0657			
32DAY-WWTP	7/30/02	10:55				8 J	43.8	20.4	0.48	3.82	3.73	9	8.1	
32DAY-WWTP	7/30/02	10:55	Y			9								
32DAY-WWTP	9/11/02	12:25		93.2		14	20.3	10.3 J	0.279	3.41	3.29	10.3	9	
32DAY-WWTP	12/2/02	12:20		109		17	23.7	19	2.97	4.16	3.71	18.9	14.8	
32DAY-WWTP	1/14/03	11:50		95		8	21	18.3	1.18	3.85	4.11	15.1	11.9	
32DAY-WWTP	2/25/03	11:55		131		12	16	14.8	0.879	2.87	2.91	10.2	7.9	
32DAY-WWTP	3/11/03	10:15		139		8	15.1	14.1	0.448	2.6	2.29	7.1	7.7	
32DAY-WWTP	4/7/03	11:05		139		7	15	12.7	0.607	2.59	2.36	11.9	10.2	
32DAY-WWTP	5/6/03	10:30		131		7	20	19.9	0.687	2.79	2.9	6.4 J	5.9 J	
32DAY-WWTP	5/6/03	10:30	Y	131		7	23.2	17.4	0.681	3.01	2.9	6.4 J	7.3 J	
32DAY-WWTP	6/10/03	12:00		110		3 J	21	16.6	0.576	3.27	3.42	11	8.6	
32DAY-WWTP	6/10/03	12:00	Y	111		4 J	16.3	16.5	0.58	3.06	3.35	11.2	6.8	
32DRY-00.5	9/5/02	10:25					3.92	3.91 J	0.024	0.206	0.17			
32GAR-00.5	7/11/02	16:45			27.1 J		2.15 J	1.67 J	0.029 J	2.85 J	1.06			
32GAR-00.5	8/1/02	11:25			72.2		2.06	1.45	0.026	1.83 J	2.13 J			
32GAR-00.5	8/14/02	14:40			0.4		2.84	2.13	0.019	4.92	5.06			
32GAR-00.5	9/4/02	13:50			0.66 J		1.66	1.12 J	0.018	3.46	3.46			
32GAR-00.5	9/19/02	13:50			0.45 J		1.84	1.23	0.02	3.33	3.6			

Table B-2. Results for nutrient and pH-related parameters for the Walla Walla River basin TMDL. Bold type indicates periphyton chlorophyll a data.

Station ID	Date	Time	Rep-licate	Alkalinity mg/L	Chlor. a ug/L	BOD mg/L	TPN mg/L	NO2/NO3 mg/L	NH3 mg/L	TP mg/L	Ortho-phos mg/L	TOC mg/L	DOC mg/L	Comments
32GAR-00.5	10/16/02	14:35			0.33		1.86	1.21	0.018	1.97	1.86	5.9 J	6.9 J	
32GAR-00.5	11/20/02	14:40			1.8		4.76	1.64	2.39	1.93	1.73	6.9	6.7	
32GAR-00.5	3/12/03	13:15					2.06	1.83	0.032	0.543	0.424	2.6	2.3	
32GAR-00.5	4/8/03	14:15			3.7		2.31	1.97	0.044	0.463	0.362	3.2	2.2	
32GAR-00.5	4/23/03	14:40			4.7		1.71	1.47	0.027	0.595	0.44			
32GAR-00.5	5/28/03	15:30			1.7		1.12	1.03	0.037	0.713	0.664			
32GAR-00.5	6/25/03	15:10			1.2		1.24	0.957	0.024	1.51	1.45			
32MIL-00.5	6/27/02	16:15		79.4	6.2		2.44	2.16	0.026	0.211	0.18	1.8	1.6	
32MIL-00.5	6/27/02	16:15	Y									1.8	1.6	
32MIL-00.5	7/11/02	9:45			**1690**									stream ctr
32MIL-00.5	7/11/02	9:45			**709 J**									right bank
32MIL-00.5	7/11/02	9:45			**1630 J**									left bank
32MIL-00.5	7/11/02	9:45	Y		**975 J**									right bank
32MIL-00.5	7/11/02	9:45	Y		**1390 J**									left bank
32MIL-00.5	7/11/02	9:45	Y		**1990 J**									stream ctr
32MIL-00.5	7/11/02	9:50		96.8 J	4.4 J		3.02 J	2.72 J	0.025 J	0.173 J	0.154 J	1.7 J	1.7 J	
32MIL-00.5	7/11/02	9:50	Y		4.5 J		2.98 J	2.72 J	0.024 J	0.178 J	0.154 J	1.8 J	1.5 J	
32MIL-00.5	8/1/02	10:15		130	2.5 J		0.303	0.039	0.018	0.168	0.15			
32MIL-00.5	8/1/02	10:15	Y		2.5 J		0.315	0.038	0.018	0.165	0.152			
32MIL-00.5	8/14/02	15:50	Y	138	11.4		0.186	0.01 U	0.01 U	0.172	0.152	2.5	2.2	
32MIL-00.5	8/14/02	15:55		138	12.5		0.192	0.01 U	0.01 U	0.174	0.152	2.4	2	
32MIL-00.5	8/14/02	15:55			**167**									left bank
32MIL-00.5	8/14/02	15:55			**245**									right bank
32MIL-00.5	8/14/02	15:55			**536**									stream ctr
32MIL-00.5	9/4/02	15:40		126 J	2.4 J		0.172	0.035 J	0.01 U	0.178	0.148	2.1	2	
32MIL-00.5	9/4/02	15:40	Y		2.5 J		0.168	0.035 J	0.01 U	0.185	0.148	2.3	2.2	
32MIL-00.5	9/19/02	15:50		117	2.9 J		0.571	0.433	0.01	0.147	0.128	2.1	1.9	
32MIL-00.5	9/19/02	15:50	Y		2.4 J		0.565	0.433	0.011	0.149	0.13	2.1	1.9	
32MIL-00.5	10/16/02	15:40		106	3.1		3.77	3.58	0.01 U	0.171	0.139	1.7 J	2.3 J	
32MIL-00.5	11/20/02	15:15		83.7	4.4		4.2	4.08	0.01 U	0.411	0.47	2.5	1.9	
32MIL-00.5	1/15/03	14:15		51.4	1.1		1.54	1.41	0.01 U	0.278	0.27	2.81	2.55	
32MIL-00.5	3/12/03	14:55		29	2.9		0.471	0.376	0.01 U	0.182	0.0821	2.9	2.9	
32MIL-00.5	4/8/03	15:55		37	3.1		0.795	0.653	0.01 U	0.161	0.12	2.1	1.9	
32MIL-00.5	4/8/03	15:55	Y		3									
32MIL-00.5	4/23/03	17:00		43	10		0.865	0.73	0.01 U	0.186	0.143	1.9	1.7	
32MIL-00.5	4/23/03	17:00	Y		10.2		0.876	0.729	0.01 U	0.187	0.137	1.8	1.8	

Table B-2. Results for nutrient and pH-related parameters for the Walla Walla River basin TMDL. Bold type indicates periphyton chlorophyll a data.

Station ID	Date	Time	Rep-licate	Alkalinity mg/L	Chlor. a ug/L	BOD mg/L	TPN mg/L	NO2/NO3 mg/L	NH3 mg/L	TP mg/L	Ortho-phos mg/L	TOC mg/L	DOC mg/L	Comments
32MIL-00.5	5/28/03	17:30		50.7	3.1		1.15	1.03	0.026	0.204	0.156	1.6	1.2	
32MIL-00.5	5/28/03	17:30	Y		3.1		1.18	1.03	0.025	0.205	0.156	1.4	1.2	
32MIL-00.5	6/25/03	17:05		105	6.6		2.26	2.06	0.026	0.12	0.0951	1.6	1.7	
32MIL-00.5	6/25/03	17:05	Y		6.7		2.33	2.06	0.024	0.12	0.0944	1.9	1.7	
32MIL-02.8	7/11/02	10:55			5.3 J		4.81 J	4.66 J	0.016 J	0.267 J	0.253 J			
32MIL-02.8	8/1/02	10:55			7.2		5.67	5.52	0.01	0.204	0.195			
32MIL-02.8	8/14/02	15:25			20		6.06	5.77	0.01 U	0.203	0.188			
32MIL-02.8	9/4/02	15:10			31.5 J		5.55	5.61 J	0.01 U	0.237	0.209			
32MIL-02.8	9/19/02	15:00			6.4 J		6.01	6.22	0.01 U	0.274	0.277			
32MIL-02.8	10/16/02	15:10			2.4		5.98	5.88	0.01 U	0.494	0.45			
32MIL-02.8	11/20/02	15:45			2.8		4.6	4.48	0.01 U	0.655	0.603			
32MIL-02.8	1/15/03	15:00			2.3		1.39	1.27	0.01 U	0.268	0.234			
32MIL-02.8	3/12/03	14:40					0.46	0.374	0.01 U	0.154	0.0825			
32MIL-02.8	4/8/03	15:35			3.4		0.748	0.611	0.01 U	0.153	0.115			
32MIL-02.8	4/23/03	16:15			10.7		0.761	0.634	0.01 U	0.16	0.121			
32MIL-02.8	5/28/03	16:50			3		1.19	1.07	0.026	0.218	0.169			
32MIL-02.8	6/25/03	16:30			10.8		5.34	5.24	0.018	0.208	0.18			
32MIL-04.8	6/27/02	13:10		61								2.4	2.4	
32MIL-04.8	7/11/02	17:10		63.2 J	14.3 J		1.49 J	1.17 J	0.042 J	0.457 J	0.367 J	3.5 J	2.7 J	
32MIL-04.8	8/1/02	15:35		74.9	9.4		0.877	0.539	0.028	0.526	0.563			
32MIL-04.8	8/14/02	14:15		75.8	4.7		1.8	1.38	0.035	0.623	0.539	3	2.6	
32MIL-04.8	9/4/02	14:20		78	3.7 J		1.88	1.57 J	0.042	0.672	0.627	3.4	2.8	
32MIL-04.8	9/19/02	14:30		75.3	2.7 J		3.02	2.79	0.054	0.669	0.571	3.2	3	
32MIL-04.8	10/16/02	12:40		76	2.9		3.31	3.21	0.039	0.631	0.54	2.7 J	3.6 J	
32MIL-04.8	11/20/02	13:20		62.5	6.1		1.4	1.25	0.01	0.192	0.158	2.7	1.7	
32MIL-04.8	1/15/03	11:45		44	1.3		1.07	0.954	0.01 U	0.27	0.237	3.12	2.62	
32MIL-04.8	3/12/03	12:15		29			0.483	0.377	0.01 U	0.171	0.109	3.1	2.8	
32MIL-04.8	4/8/03	12:20		35	3.3		0.916	0.768	0.01 U	0.213	0.174	2.1	1.9	
32MIL-04.8	4/23/03	15:30		37	9.3		0.37	0.265	0.01 U	0.111	0.0768	2	1.6	
32MIL-04.8	5/28/03	16:10		42	2.2		0.404	0.316	0.01 U	0.13	0.0819	1.5	1.1	
32MIL-04.8	6/25/03	15:42		76	16.4		2.8	2.49	0.047	0.598	0.534	2.2	2	
32MIL-06.7	6/27/02	12:30										1.9	1.7	
32MIL-06.7	7/11/02	15:40			1.5 J		0.82 J	0.651 J	0.019 J	0.062 J	0.0407 J			
32MIL-06.7	8/1/02	16:10			15.9		0.942	0.816	0.019	0.142	0.134			
32MIL-06.7	8/14/02	13:50			20.1		1.16	0.923	0.026	0.07	0.0426			
32MIL-06.7	9/4/02	11:50			11.8 J		1.23	1.18 J	0.01 U	0.08	0.0455	1.3	1.3	

Table B-2. Results for nutrient and pH-related parameters for the Walla Walla River basin TMDL. Bold type indicates periphyton chlorophyll a data.

Station ID	Date	Time	Rep-licate	Alkalinity mg/L	Chlor. a ug/L	BOD mg/L	TPN mg/L	NO2/NO3 mg/L	NH3 mg/L	TP mg/L	Ortho-phos mg/L	TOC mg/L	DOC mg/L	Comments
32MIL-06.7	9/19/02	12:40			4.1 J		1.3	1.25	0.011	0.093	0.0594	1.3	1.1	
32MIL-06.7	10/16/02	11:40			2.7		1.31	1.2	0.01 U	0.094	0.053			
32MIL-06.7	11/20/02	12:00			1.2		0.737	0.665	0.01 U	0.069	0.0436			
32MIL-06.7	1/15/03	10:45			2		0.392	0.313	0.01 U	0.068	0.0353			
32MIL-06.7	3/12/03	10:30					0.284	0.205	0.01 U	0.095	0.0367			
32MIL-06.7	4/8/03	12:00			2.4		0.374	0.256	0.01 U	0.065	0.024			
32MIL-06.7	4/23/03	12:10			4.5		0.312	0.222	0.01 U	0.055	0.021	1.6	1.7	
32MIL-06.7	5/28/03	13:15			3.3		0.302	0.162	0.019	0.075	0.029	1.4	1 U	
32MIL-06.7	6/25/03	12:20			3.4		1.73	1.67	0.012	0.08	0.0535	1.2	1.3	
32MIL-08.5	8/1/02	17:15			1.4		0.246	0.01 U	0.01 U	0.04	0.021			
32MIL-08.5	4/23/03	11:25			3.1		0.19	0.111	0.01 U	0.051	0.02			
32MIL-08.5	5/28/03	12:00			3.8		0.205	0.064	0.014	0.068	0.024			
32MIL-11.5	6/27/02	10:50		40.4	2.9						0.03	1.4	1.2	
32MIL-11.5	7/11/02	14:40		43 J	2 J		0.114 J	0.012 J	0.01 UJ	0.061 J	0.0317 J	1.5 J	1.3 J	
32MIL-11.5	8/1/02	17:40		45	1.4		0.108	0.01 U	0.01 U	0.066	0.0394			
32MIL-11.5	8/14/02	12:25		46	1.3		0.085	0.01 U	0.01 U	0.061	0.0357	1.4	1.2	
32MIL-11.5	9/4/02	10:40		46	1.3 J		0.046	0.01 UJ	0.01 U	0.06	0.032	1.2	1.1	
32MIL-11.5	9/19/02	11:40		44	1.2 J		0.051	0.01 U	0.01 U	0.065	0.0334	1.2	1	
32MIL-11.5	10/16/02	10:10		44	0.8		0.041	0.01 U	0.01 U	0.061	0.023	1 UJ	1.2 J	
32MIL-11.5	11/20/02	10:50		44	1.2		0.055	0.011	0.01 U	0.06	0.028	1.7	1.7	
32MIL-11.5	1/15/03	10:15		35	1		0.307	0.23	0.01 U	0.064	0.0382	2.81	1.96	
32MIL-11.5	3/12/03	9:50		26			0.266	0.186	0.01 U	0.093	0.0375	3.1	2.8	
32MIL-11.5	4/8/03	11:00		31	1.6		0.287	0.204	0.01 U	0.068	0.026	1.9	2	
32MIL-11.5	4/23/03	10:45		33	5.9		0.08 J	0.095 J	0.01 U	0.063	0.024	1.8	1.8	
32MIL-11.5	5/28/03	11:40		36	6		0.191	0.1	0.01 U	0.075	0.0306	1.1	1 U	
32MIL-11.5	6/25/03	10:45		43	2		0.072	0.01 U	0.01 U	0.049	0.024	1 U	1 U	
32MIL-12.8	7/11/02	14:10			2 J		0.162 J	0.089 J	0.017 J	0.061 J	0.0407 J			
32MIL-12.8	8/1/02	18:15			1.6		0.089	0.024	0.01 U	0.064	0.0461			
32MIL-12.8	8/14/02	12:10			2.4		0.065	0.013	0.01 U	0.064	0.0431			
32MIL-12.8	9/4/02	10:00			3.1 J		0.032		0.01 U	0.06	0.0359			
32MIL-12.8	9/19/02	11:10			4 J		0.053	0.01 U	0.01 U	0.069	0.04			
32MIL-12.8	4/23/03	10:20			6.9		0.15	0.073	0.01 U	0.054	0.026			
32MIL-12.8	5/28/03	11:10			4.2		0.187	0.142	0.012	0.078	0.0349			
32MIL-12.8	6/25/03	10:15			4		0.079	0.028	0.01 U	0.046	0.0311			
32MIL-21.1	6/27/02	9:30		34.1	2		0.116	0.052	0.01 U	0.056	0.0388	1	1 U	
32MIL-21.1	7/11/02	13:10		37 J	1.1 J		0.104 J	0.06 J	0.011 J	0.055 J	0.0413 J	1 UJ	1 UJ	

Table B-2. Results for nutrient and pH-related parameters for the Walla Walla River basin TMDL. Bold type indicates periphyton chlorophyll a data.

Station ID	Date	Time	Rep-licate	Alkalinity mg/L	Chlor. a ug/L	BOD mg/L	TPN mg/L	NO2/NO3 mg/L	NH3 mg/L	TP mg/L	Ortho-phos mg/L	TOC mg/L	DOC mg/L	Comments
32MIL-21.1	7/11/02	13:15			**140**									stream ctr
32MIL-21.1	7/11/02	13:15			**301**									left bank
32MIL-21.1	7/11/02	13:15			**283**									right bank
32MIL-21.1	8/1/02	19:10		39	0.92		0.106	0.067	0.01 U	0.063	0.0522			
32MIL-21.1	8/14/02	15:55			**321**									left bank
32MIL-21.1	8/14/02	16:00			**103**									stream ctr
32MIL-21.1	8/14/02	16:05			**55**									right bank
32MIL-21.1	8/14/02	11:10		39	0.89		0.082	0.057	0.01 U	0.06	0.053	1 U	1 U	
32MIL-21.1	9/4/02	9:30		39	1.1 J		0.04	0.035 J	0.01 U	0.066	0.0457	1 U	1 U	
32MIL-21.1	9/19/02	10:15		38	1.3 J		0.098	0.069	0.01 U	0.076	0.0524	1 U	1 U	
32MIL-21.1	10/16/02	9:20		39	0.97		0.106	0.084	0.01 U	0.081	0.0474	1 U	1.1	
32MIL-21.1	11/20/02	10:15		38	1.9		0.1	0.073	0.01 U	0.068	0.0463	1.3	1.3	
32MIL-21.1	1/15/03	9:15		32	0.96		0.17	0.122	0.01 U	0.062	0.0443	2.43	2.14	
32MIL-21.1	3/12/03	9:10		23	0.74		0.101	0.042	0.01 U	0.072	0.0332	2.5	2.7	
32MIL-21.1	4/8/03	9:45		26	0.51		0.081	0.036	0.01 U	0.061	0.028	1.2	1.3	
32MIL-21.1	4/23/03	8:55		27	1		0.069	0.038	0.01 U	0.056	0.0321	1.1 J	1.3 J	
32MIL-21.1	5/28/03	10:30		30	1.5 J		0.184	0.102	0.01 U	0.072	0.0349	1 U	1 U	
32MIL-21.1	6/25/03	9:26		37	0.29		0.068	0.062	0.01 U	0.056	0.0447	1 U	1 U	
32MUD-00.5	9/18/02	12:50			2.2 J		0.183	0.01 U	0.01 U	0.171	0.13			
32NFT-00.0	6/25/02	10:25		36.6	3.7		0.115	0.045	0.01 U	0.045	0.033	1	1	
32NFT-00.0	7/9/02	11:25		39	1.6		0.142	0.074	0.012	0.05	0.035	1	1 U	
32NFT-00.0	7/9/02	11:25			**1170**									left bank
32NFT-00.0	7/9/02	11:25			**658**									stream ctr
32NFT-00.0	7/9/02	11:25			**211**									right bank
32NFT-00.0	7/30/02	11:45			2 J		0.108	0.057	0.01 U	0.061	0.0475	1	1.1	
32NFT-00.0	8/13/02	8:56		42	1.7 J		0.104	0.058	0.01 U	0.061	0.0427	1.1	1 U	
32NFT-00.0	8/13/02	9:00			**1190 J**									left bank
32NFT-00.0	8/13/02	9:00			**748 J**									stream ctr
32NFT-00.0	8/13/02	9:00			**1130 J**									right bank
32NFT-00.0	9/3/02	9:45			1.5 J		0.05	0.024 J	0.01 U	0.063	0.0399	1 U	1 U	
32NFT-00.0	9/17/02	9:10			1.6 J			0.022	0.01 U	0.068	0.0405			
32NFT-00.0	4/21/03	9:50			6.5 J		0.051	0.01 U	0.01 U	0.057	0.028	1.5	1.3	
32NFT-00.0	5/26/03	10:25			10.5		0.178	0.109	0.01 U	0.076	0.029	1.2	1 U	
32NFT-00.0	6/23/03	10:30			2.9		0.076	0.028	0.01 U	0.049	0.0363	1 U	1 U	
32PAT-00.1	7/30/02	13:05			2		3.5	3.34	0.024	0.124	0.114			
32PAT-00.1	9/3/02	11:40			2.5 J		4.02	4.1 J	0.012	0.155	0.118			

Table B-2. Results for nutrient and pH-related parameters for the Walla Walla River basin TMDL. Bold type indicates periphyton chlorophyll a data.

Station ID	Date	Time	Rep-licate	Alkalinity mg/L	Chlor. a ug/L	BOD mg/L	TPN mg/L	NO2/NO3 mg/L	NH3 mg/L	TP mg/L	Ortho-phos mg/L	TOC mg/L	DOC mg/L	Comments
32PAT-00.1	4/21/03	12:55			9.1		1.04	0.908	0.01 U	0.064	0.0558			
32PAT-00.1	5/26/03	11:10			7.8		1.05	0.891	0.018	0.121	0.0608			
32PAT-00.1	6/23/03	12:00			13.6		1.89	1.68	0.013	0.067	0.0465			
32RUS-00.1	8/1/02	12:45					2.48	2.44	0.01 U	0.151	0.131			
32SFT-00.0	6/25/02	10:45		32.3	0.83		0.197	0.13	0.014	0.035	0.029	1.1	1	
32SFT-00.0	7/9/02	12:00		35	1		0.22	0.149	0.01 U	0.039	0.028	1.2	1.3	
32SFT-00.0	7/30/02	11:55			1.2		0.364	0.299	0.01 U	0.044	0.041	1.4	1.4	
32SFT-00.0	8/13/02	9:10		46	1.1		0.485	0.396	0.01 U	0.054	0.039	1.2		
32SFT-00.0	9/3/02	9:50			11.5 J		0.452	0.414 J	0.01 U	0.055	0.0349	1.4	1.3	
32SFT-00.0	9/17/02	9:30						0.338	0.01 U	0.059	0.0375			
32SFT-00.0	4/21/03	10:25			5.6		0.11	0.056	0.01 U	0.05	0.025	1.6	1.5	
32SFT-00.0	5/26/03	10:10			4.3		0.206	0.141	0.01 U	0.062	0.024	1.6	1 U	
32SFT-00.0	6/23/03	10:15			4.4		0.409	0.334	0.01 U	0.039	0.029	1.2 J	1.5 J	
32TOU-00.5	6/25/02	17:00		50.8	1.1		0.218	0.042	0.024	0.091	0.0633	1.9	1.6	
32TOU-00.5	6/25/02	17:00	Y		1.2		0.228	0.039	0.023	0.091	0.0635	1.7	1.6	
32TOU-00.5	7/9/02	17:50		57.2	0.98		0.228	0.061	0.031	0.092	0.0607	2	1.8	
32TOU-00.5	7/9/02	17:50	Y		1		0.242	0.061	0.022	0.089	0.062	1.9	1.9	
32TOU-00.5	7/29/02	16:45		68.6	1.9		0.298	0.075	0.012	0.106	0.0845	2.5	2.5	
32TOU-00.5	7/29/02	16:45	Y	68.7	1.6		0.28 J	0.075	0.014	0.114	0.0863	2.6	2.6	
32TOU-00.5	8/13/02	14:50		75.6	1.4		0.439	0.229	0.012	0.086	0.0597	2.5	2.1	
32TOU-00.5	8/13/02	14:50	Y		1.2		0.465	0.229	0.013	0.088	0.0598	2.4	2	
32TOU-00.5	9/2/02	13:10		81.4	1.3 J		0.402	0.21 J	0.01 U	0.088	0.056	2.6	2.6	
32TOU-00.5	9/2/02	13:10	Y		1.2 J		0.399	0.212 J	0.012	0.088	0.0555	2.7	2.7	
32TOU-00.5	9/17/02	17:15		76.4	0.93 J		0.367	0.195	0.01 U	0.076	0.0497	2.4		
32TOU-00.5	9/17/02	17:15	Y		0.88 J			0.195	0.01 U	0.076	0.05	2.3	1.8	
32TOU-00.5	9/18/02	16:00										2.4	2.3	
32TOU-00.5	10/15/02	15:15		62.8	1		0.176	0.085	0.01 U	0.067	0.0385	1.6 J	2.1 J	
32TOU-00.5	10/15/02	15:15	Y		1.1		0.173	0.085	0.01 U	0.069	0.0375	1.6 J	2 J	
32TOU-00.5	11/19/02	15:35		56.9	1.6		0.159	0.064	0.01 U	0.069	0.042	1.9	1.8	
32TOU-00.5	11/19/02	15:35	Y		1.5		0.158	0.064	0.01 U	0.066	0.0411	1.9	1.7	
32TOU-00.5	1/14/03	16:15		47	1.8		0.528	0.431	0.01 U	0.091	0.0536	2.5	2.52	
32TOU-00.5	1/14/03	16:15	Y		1.9		0.528	0.431	0.01 U	0.089	0.0537	2.22	2.3	
32TOU-00.5	3/11/03	13:30		30	3.5		0.857	0.634	0.019	1	0.065	4.9	4.8	
32TOU-00.5	3/11/03	13:30	Y				0.868	0.639	0.018	0.975	0.065	5.1	4.9	
32TOU-00.5	4/7/03	15:20		38	0.64		0.718	0.614	0.01 U	0.158	0.0402	2.8	2.5	
32TOU-00.5	4/7/03	15:20	Y				0.675	0.612	0.01 U	0.154	0.0404	2.2	2.5	

Table B-2. Results for nutrient and pH-related parameters for the Walla Walla River basin TMDL. Bold type indicates periphyton chlorophyll a data.

Station ID	Date	Time	Rep-licate	Alkalinity mg/L	Chlor. a ug/L	BOD mg/L	TPN mg/L	NO2/NO3 mg/L	NH3 mg/L	TP mg/L	Ortho-phos mg/L	TOC mg/L	DOC mg/L	Comments
32TOU-00.5	4/22/03	15:10		46	2.5		0.355	0.254	0.01 U	0.085	0.0312	1.8 J	1.7	
32TOU-00.5	4/22/03	15:10	Y		2.7		0.363	0.254	0.01 U	0.082	0.0307	2	1.8	
32TOU-00.5	5/27/03	14:58		50	2.9		0.151	0.022	0.01 U	0.058	0.015	1.8	1.2	
32TOU-00.5	5/27/03	14:58	Y		2.9		0.149	0.023	0.01 U	0.06	0.015	1.8	1.3	
32TOU-00.5	6/24/03	16:30		63.8	1.7		0.251	0.097	0.017	0.073	0.0476	1.7 J	2.3 J	
32TOU-00.5	6/24/03	16:30	Y		1.7		0.25	0.096	0.016	0.072	0.0475	1.8	1.7	
32TOU-02.0	6/25/02	16:35			1.2		0.195	0.023	0.021	0.087	0.0607			
32TOU-02.0	7/9/02	16:40			0.79		0.199	0.026	0.016	0.082	0.0559			
32TOU-02.0	7/9/02	19:30			**54.8**									left bank
32TOU-02.0	7/9/02	19:30			**27.4**									right bank
32TOU-02.0	7/9/02	19:30			**17.4**									stream ctr
32TOU-02.0	7/29/02	16:00			2.4		0.222	0.03	0.011	0.105	0.0881			
32TOU-02.0	8/13/02	14:00			1.3		0.338	0.127	0.016	0.082	0.0576			
32TOU-02.0	8/13/02	14:00			**1340**									left bank
32TOU-02.0	8/13/02	14:03			**473**									stream ctr
32TOU-02.0	8/13/02	14:06			**317**									right bank
32TOU-02.0	9/2/02	12:45			1.3 J		0.273	0.08 J	0.011	0.087	0.0559			
32TOU-02.0	9/17/02	16:55			1.1 J		0.262	0.067	0.01 U	0.075	0.0498			
32TOU-02.0	4/22/03	14:40			2.8		0.331	0.24	0.01 U	0.076	0.0306			
32TOU-02.0	5/27/03	14:25			3.5		0.154	0.019	0.01 U	0.061	0.014			
32TOU-02.0	6/24/03	16:05			1.4		0.21	0.057	0.012	0.066	0.0446			
32TOU-07.0	6/25/02	16:20			1.1		0.194	0.011	0.017	0.088	0.0602	1.8	1.8	
32TOU-07.0	7/9/02	17:15			0.87		0.178	0.01 U	0.013	0.086	0.0586	2	1.8	
32TOU-07.0	7/29/02	15:05		62.4	1.3		0.208	0.01 U	0.011	0.096	0.0811	2.3	2.3	
32TOU-07.0	8/13/02	13:35			0.86		0.187	0.01 U	0.01 U	0.085	0.0614	2.1	1.9	
32TOU-07.0	9/2/02	12:20			1.1 J		0.186	0.01 UJ	0.013	0.09	0.061	2.5	2.4	
32TOU-07.0	9/17/02	16:35			0.66 J		0.194	0.01 U	0.01 U	0.079	0.0535	2.3		
32TOU-07.0	10/15/02	14:35		57.1	0.31		0.07	0.01 U	0.01 U	0.068	0.038	1.5 J	1.8 J	
32TOU-07.0	11/19/02	14:50		54.3	1.3		0.079	0.01 U	0.01 U	0.064	0.0386	1.8	1.8	
32TOU-07.0	1/14/03	15:45		47	2		0.545	0.447	0.01 U	0.089	0.0559	2.8	2.35	
32TOU-07.0	3/11/03	13:05		30			0.798	0.598	0.028	0.968	0.0634	5.2	4.8	
32TOU-07.0	4/7/03	14:50		37	0.65		0.663	0.623	0.01 U	0.145	0.0404	2.6	2.5	
32TOU-07.0	4/22/03	14:15			3.3		0.329	0.247	0.01 U	0.073	0.029	2 J	1.7	
32TOU-07.0	5/27/03	14:00			3.9		0.14	0.022	0.01 U	0.056	0.014	1.7	1.6	
32TOU-07.0	6/24/03	14:45			0.92		0.13	0.01 U	0.01	0.056	0.0385	1.6	1.7	
32TOU-17.8	6/25/02	15:35		48.7	1.4		0.208	0.018	0.025	0.079	0.0552	1.7	1.6	

Table B-2. Results for nutrient and pH-related parameters for the Walla Walla River basin TMDL. Bold type indicates periphyton chlorophyll a data.

Station ID	Date	Time	Rep-licate	Alkalinity mg/L	Chlor. a ug/L	BOD mg/L	TPN mg/L	NO2/NO3 mg/L	NH3 mg/L	TP mg/L	Ortho-phos mg/L	TOC mg/L	DOC mg/L	Comments
32TOU-17.8	7/9/02	16:00		52.7	1		0.172	0.01 U	0.013	0.087	0.0599	1.8	1.8	
32TOU-17.8	7/29/02	13:35		58.4	1.2		0.185	0.01 U	0.01 U	0.094	0.0827	2	2.1	
32TOU-17.8	8/13/02	12:00		60.4	1.1		0.155	0.01 U	0.01 U	0.095	0.0737	1.9	1.7	
32TOU-17.8	9/2/02	11:15		60.4	1.4 J		0.136	0.01 UJ	0.01 U	0.096	0.0664	2.1	2.1	
32TOU-17.8	9/17/02	14:50			1.1 J		0.145	0.01 U	0.01 U	0.084	0.0601	1.9		
32TOU-17.8	10/15/02	13:40		55.9								1.5	1.6	
32TOU-17.8	11/19/02	14:05		53.7								1.9	1.7	
32TOU-17.8	1/14/03	15:05		45								3.6	2.5	
32TOU-17.8	3/11/03	12:35		31								5.3	4.4	
32TOU-17.8	4/7/03	13:30		38								2.3 J	2.7 J	
32TOU-17.8	4/22/03	13:30		43	4.4		0.385	0.299	0.01 U	0.074	0.029	2.1 J	1.8	
32TOU-17.8	5/27/03	12:35		45	7.3		0.233	0.137	0.01 U	0.071	0.025	1.7	1.4	
32TOU-17.8	6/24/03	14:00		57	2.3		0.13	0.01 U	0.01 U	0.065	0.0433	1.6	1.6	
32TOU-25.0	9/17/02	13:50		59.1	1.4 J		0.123	0.01 U	0.01 U	0.084	0.0605	1.8		
32TOU-30.6	9/17/02	13:10			1.7 J		0.113	0.01 U	0.01 U	0.087	0.062			
32TOU-34.2	6/25/02	14:45		44.9	2.3		0.255	0.108	0.021	0.075	0.0539	1.5	1.5	
32TOU-34.2	7/9/02	15:13		49	3.8		0.19	0.031	0.014	0.075	0.0511	1.6	1.6	
32TOU-34.2	7/29/02	12:00			2.6		0.202	0.031	0.012	0.075	0.0623	1.7	1.7	
32TOU-34.2	8/13/02	11:20		57.8	1.8		0.162	0.04	0.01 U	0.081	0.0588	1.6	1.3	
32TOU-34.2	9/2/02	9:25			2.2 J		0.122	0.032 J	0.01 U	0.082	0.0536	1.6	1.5	
32TOU-34.2	9/17/02	12:20			2.7 J		0.18	0.062	0.01 U	0.089	0.0609	1.7		
32TOU-34.2	10/15/02	12:50		53.7	1.8		0.118	0.058	0.015	0.072	0.0809	1.2 J	1.5 J	
32TOU-34.2	11/19/02	13:05		52.8	0.32		0.231	0.147	0.01 U	0.076	0.049	2	1.6	
32TOU-34.2	1/14/03	14:05		44	2.1		0.535	0.441	0.01 U	0.09	0.0598	2.8	2.29	
32TOU-34.2	3/11/03	11:55		31			0.707	0.53	0.01 U	0.422	0.06	4.7	4.3	
32TOU-34.2	4/7/03	12:40		37	1		0.785	0.703	0.01 U	0.093	0.0381	2.6	2.6	
32TOU-34.2	4/22/03	10:45			7.1		0.531	0.455	0.01 U	0.062	0.027	1.8 J	1.7	
32TOU-34.2	5/27/03	10:48			9.8		0.431	0.303	0.021	0.081	0.032	1.5	1.1	
32TOU-34.2	6/24/03	12:05			4.1		0.21	0.09	0.013	0.057	0.0381	1.7	1.5	
32TOU-40.5	6/25/02	13:30			1.9		0.311	0.178	0.026	0.07	0.0529			
32TOU-40.5	7/9/02	14:30			3		0.257	0.112	0.02	0.076	0.0505			
32TOU-40.5	7/29/02	9:11		54.2	3.3 J		0.247	0.093	0.014	0.07	0.0543	1.8	1.7	
32TOU-40.5	7/30/02	15:45		50.7	3		0.223	0.078	0.018	0.095	0.076	1.6	1.6	
32TOU-40.5	8/13/02	11:00			4		0.252	0.125	0.013	0.082	0.0581			
32TOU-40.5	9/2/02	8:45		55.1	2.8 J		0.192	0.107 J	0.01 U	0.079	0.0562	1.5	1.3	
32TOU-40.5	9/3/02	13:50		53	2.6 J		0.173	0.074 J	0.01 U	0.09	0.0657	1.7	1.5	

Table B-2. Results for nutrient and pH-related parameters for the Walla Walla River basin TMDL. Bold type indicates periphyton chlorophyll a data.

Station ID	Date	Time	Rep-licate	Alkalinity mg/L	Chlor. a ug/L	BOD mg/L	TPN mg/L	NO2/NO3 mg/L	NH3 mg/L	TP mg/L	Ortho-phos mg/L	TOC mg/L	DOC mg/L	Comments
32TOU-40.5	9/17/02	11:55		56	3.9 J		0.266	0.165	0.01	0.084	0.0593	1.6	1.3	
32TOU-40.5	4/21/03	15:30		40	3.5		0.413	0.337	0.01 U	0.068	0.0364	1.8	1.6	
32TOU-40.5	4/22/03	9:25		43	5.8		0.545	0.48	0.01 U	0.063	0.027	3.9	1.6	
32TOU-40.5	5/26/03	14:45		41	14.1		0.368	0.228	0.019	0.087	0.038	1.5	1.1	
32TOU-40.5	5/27/03	9:05		43	11.4		0.406	0.293	0.014	0.075	0.029	1.4	1.2	
32TOU-40.5	6/23/03	14:10		51	7		0.258	0.126	0.021	0.063	0.0443	1.2 J	1.4 J	
32TOU-40.5	6/24/03	10:30		53.2	6.1 J		0.269	0.162	0.013	0.055	0.0384	1.3 J	1.6 J	
32TOU-46.2	6/25/02	12:45		40.3	1.7		0.257	0.139	0.025	0.066	0.0532			
32TOU-46.2	7/9/02	13:45		43	3.4		0.22	0.102	0.018	0.075	0.0512			
32TOU-46.2	7/30/02	14:20			4.8		0.188	0.06	0.017	0.081	0.0724	1.6	1.5	
32TOU-46.2	8/13/02	10:20		49	3.6		0.199	0.1	0.01	0.077	0.0563			
32TOU-46.2	9/3/02	12:40			3.2 J		0.139	0.059 J	0.01	0.093	0.0668	1.7	1.2	
32TOU-46.2	9/17/02	11:15			3.7 J		0.226	0.139	0.01 U	0.088	0.0594	1.4	1.2	
32TOU-46.2	10/15/02	11:45		46	2		0.084	0.047	0.01 U	0.076	0.0431	1 UJ	1.4 J	
32TOU-46.2	11/19/02	11:55		44	6.1		0.134	0.071	0.01 U	0.076	0.0497	1.6	1.3	
32TOU-46.2	1/14/03	13:10		39	1.8		0.327	0.253	0.01 U	0.077	0.0551	2.8	2.35	
32TOU-46.2	3/11/03	11:10		31			0.558	0.418	0.01 U	0.235	0.0594	4.5	4.1	
32TOU-46.2	4/7/03	11:50		34	0.81		0.434	0.359	0.01 U	0.081	0.0355	2.3	2.5	
32TOU-46.2	4/21/03	13:40			4.8		0.13	0.07	0.01 U	0.059	0.0358	1.9	1.4	
32TOU-46.2	5/26/03	13:25			13.2		0.24	0.115	0.011	0.082	0.0366	1.4	1	
32TOU-46.2	6/23/03	12:45			5		0.15	0.053	0.012	0.057	0.0425	1 J	1.4 J	
32TOU-51.2	6/25/02	12:10			2.5		0.31	0.189	0.029	0.071	0.0562			
32TOU-51.2	7/9/02	13:00			2.7		0.364	0.248	0.022	0.079	0.0628			
32TOU-51.2	7/30/02	13:35			5.3		0.359	0.262	0.017	0.107	0.0866	1.2	1.3	
32TOU-51.2	8/13/02	10:05			4.1 J		0.403	0.302	0.01 U	0.095	0.0773			
32TOU-51.2	9/3/02	12:00			3.9 J		0.317	0.269 J	0.011	0.118	0.0857	1.2	1.1	
32TOU-51.2	9/17/02	10:35			4.3 J		0.443	0.332	0.012	0.106	0.083	1.4	1.4	
32TOU-51.2	4/21/03	11:10			7.5		0.18	0.123	0.01 U	0.066	0.0358	1.6	1.4	
32TOU-51.2	5/26/03	12:25			13.2		0.233	0.164	0.01 U	0.088	0.0415	1.4	1 U	
32TOU-51.2	6/23/03	11:00			5.3		0.27	0.187	0.01 U	0.069	0.0538	1.7	1.3	
32TOU-53.9	7/30/02	12:45		41										
32TOU-53.9	9/3/02	11:15		43										
32TOU-53.9	9/17/02	10:00		44	2.4 J							1.4	1.1	
32TOU-53.9	10/15/02	10:50		41	2.5		0.044	0.026	0.01 U	0.068	0.0362	1 U	1 U	
32TOU-53.9	11/19/02	10:35		40	2.3		0.059	0.025	0.01 U	0.061	0.0357	1.3	1.2	
32TOU-53.9	1/14/03	11:15		36	1.2		0.2	0.145	0.01 U	0.06	0.0388	2.1	2.09	

Table B-2. Results for nutrient and pH-related parameters for the Walla Walla River basin TMDL. Bold type indicates periphyton chlorophyll a data.

Station ID	Date	Time	Rep-licate	Alkalinity mg/L	Chlor. a ug/L	BOD mg/L	TPN mg/L	NO2/NO3 mg/L	NH3 mg/L	TP mg/L	Ortho-phos mg/L	TOC mg/L	DOC mg/L	Comments
32TOU-53.9	3/11/03	9:45		30	2.1		0.346	0.25	0.01 U	0.14	0.044	3.8	3.8	
32TOU-53.9	4/7/03	9:41		31	0.84		0.22	0.152	0.01 U	0.069	0.027	2	2.1	
32TOU-53.9	4/21/03	10:50		32										
32TOU-53.9	5/26/03	10:50		33										
32TOU-53.9	6/23/03	9:38		40										
32WAL-09.3	4/9/03	12:00		45	1.7		0.809	0.661	0.014	0.173	0.0609	2.3	2.3	
32WAL-09.3	4/9/03	12:00	Y	46	1.8		0.814	0.661	0.011	0.167	0.0608	2.3	2.4	
32WAL-09.3	4/24/03	14:40		57.9	3.6		0.569	0.457	0.01 U	0.101	0.0499			
32WAL-09.3	4/24/03	14:40	Y	57	3.7		0.582	0.458	0.01 U	0.103	0.0503			
32WAL-09.3	8/15/02	10:30		143	3.7 J		0.619	0.321	0.031	0.109	0.0761	2.8	2.8	
32WAL-09.3	8/15/02	10:35	Y	145	4.6 J		0.566	0.321	0.03	0.103	0.0771	3	2.8	
32WAL-09.3	1/16/03	14:40		61.6	1.6		0.869	0.767	0.01 U	0.132	0.0923	2.2	2.15	
32WAL-09.3	1/16/03	14:40	Y	61.4	1.6		0.855	0.769	0.01 U	0.131	0.0915	2.5	2.1	
32WAL-09.3	7/10/02	17:00		108	4.2		0.619	0.376	0.025	0.107	0.0761 J	2.3	2.1	
32WAL-09.3	7/10/02	17:00	Y	108	3.8		0.586	0.376	0.025	0.11	0.0708	2.3	2	
32WAL-09.3	7/31/02	10:05		146	2.7		0.793	0.503	0.045	0.142	0.113			
32WAL-09.3	7/31/02	10:05	Y	147	2.7		0.785	0.503	0.045	0.132	0.113			
32WAL-09.3	6/26/02	15:00		83.9			0.454	0.247	0.017	0.108	0.0672	2.2	2.1	
32WAL-09.3	6/26/02	15:00	Y	84.2			0.454	0.248	0.021	0.11	0.0675	2.1	2.1	
32WAL-09.3	6/26/03	16:50		119	9.3		0.565	0.373	0.014	0.094				
32WAL-09.3	6/26/03	16:50	Y	120	8.9		0.589	0.372	0.013	0.094				
32WAL-09.3	3/13/03	11:30		34	2.5		0.589	0.45	0.01 U	0.582	0.0629	3.6	3.8	
32WAL-09.3	3/13/03	11:30	Y	35	2.4		0.586	0.451	0.011	0.563	0.0639	3.5	3.8	
32WAL-09.3	5/29/03	17:25		69.7	2.5		0.546	0.355	0.043	0.132	0.0645			
32WAL-09.3	5/29/03	17:25	Y	69.8	2.5		0.571	0.355	0.043	0.14	0.0646			
32WAL-09.3	11/21/02	13:15		102	4.7		0.834	0.647	0.01 U	0.098	0.0667	3.2	2.9	
32WAL-09.3	11/21/02	13:15	Y	101	4.4		0.841	0.647	0.01 U	0.099	0.067	3.1	2.8	
32WAL-09.3	10/17/02	13:10		118	0.91		0.552	0.389	0.013	0.068	0.033	3	3	
32WAL-09.3	10/17/02	13:10	Y	118	0.85		0.567	0.389	0.01 U	0.068		2.9	2.9	
32WAL-09.3	9/5/02	13:15		163	4 J		0.829	0.576 J	0.022	0.094	0.0573	3.4	3.5	
32WAL-09.3	9/5/02	13:15	Y	162	4.3 J		0.844	0.578 J	0.024	0.095	0.0587			
32WAL-09.3	9/18/02	15:20		134	1 J		0.34	0.132	0.012	0.079	0.0498	3.1	2.7	
32WAL-09.3	9/18/02	15:20	Y	133	1 J		0.346	0.131	0.014	0.081	0.0494	3.2	2.9	
32WAL-12.0	3/13/03	11:10										4	3.8	
32WAL-15.6	6/26/02	14:00					0.483	0.262	0.023	0.113	0.0696	2.3	2	
32WAL-15.6	7/10/02	15:45			2.9		0.593	0.372	0.042	0.126	0.0782	2.5	2.2	

Table B-2. Results for nutrient and pH-related parameters for the Walla Walla River basin TMDL. Bold type indicates periphyton chlorophyll a data.

Station ID	Date	Time	Rep-licate	Alkalinity mg/L	Chlor. a ug/L	BOD mg/L	TPN mg/L	NO2/NO3 mg/L	NH3 mg/L	TP mg/L	Ortho-phos mg/L	TOC mg/L	DOC mg/L	Comments
32WAL-15.6	7/10/02	16:20			**1100**									stream ctr
32WAL-15.6	7/10/02	16:20			**313**									right bank
32WAL-15.6	7/10/02	16:20			**2020**									left bank
32WAL-15.6	7/31/02	10:55			2.5		0.858	0.588	0.044	0.142	0.111	2.8	2.7	
32WAL-15.6	8/15/02	11:20			1.8		1.07	0.761	0.031	0.117	0.0851	2.8	2.6	
32WAL-15.6	8/15/02	11:20			**836**									left bank
32WAL-15.6	8/15/02	11:25			**1620**									stream ctr
32WAL-15.6	8/15/02	11:30			**1650**									right bank
32WAL-15.6	9/5/02	12:30			1.3 J		0.968	0.767 J	0.018	0.096	0.0654	3	2.9	
32WAL-15.6	9/18/02	14:45			2.7 J		0.538	0.35	0.01 U	0.113	0.0778	3.3	2.7	
32WAL-15.6	10/17/02	12:30										3.3	3.4	
32WAL-15.6	1/16/03	14:00										2.1	2.1	
32WAL-15.6	4/9/03	11:30										2.2	2.3	
32WAL-15.6	4/24/03	14:05			4.3		0.584	0.476	0.01 U	0.09	0.0431	2	1.7	
32WAL-15.6	5/29/03	17:00			3		0.523	0.317	0.031	0.128	0.0634	1.9	1.5	
32WAL-15.6	6/26/03	16:00			3.8		0.695	0.501	0.01 U	0.099		2.4	2.1	
32WAL-22.7	6/26/02	16:15		149			0.66	0.361	0.032	0.166	0.105	2.9	2.7	
32WAL-22.7	7/10/02	15:10		141	3.3		0.492	0.246	0.037	0.156	0.102	2.5	2.3	
32WAL-22.7	7/31/02	11:50		181	1.4		0.628	0.312	0.031	0.214	0.18	3.5	3.5	
32WAL-22.7	8/15/02	12:05		163	0.78		0.551	0.286	0.01 U	0.146	0.129	2.9	2.6	
32WAL-22.7	9/5/02	11:47		145	1.8 J		0.396	0.213 J	0.01 U	0.149	0.113	2.6	2.4	
32WAL-22.7	9/18/02	13:40		110	2 J		0.244	0.074	0.01 U	0.142	0.11	2.6	2.5	
32WAL-22.7	10/17/02	11:45		161	0.77		0.312	0.141	0.01 U	0.097	0.0602	3.4	3.2	
32WAL-22.7	11/21/02	12:15		124	3.4		1.38	1.17	0.01 U	0.159	0.13	3.6	3.2	
32WAL-22.7	1/16/03	13:35		64.7	1.5		0.988	0.884	0.01 U	0.14	0.102	2.6	2.4	
32WAL-22.7	3/13/03	10:20		35			0.601	0.448	0.01 U	0.403	0.0615	2.8	2.9	
32WAL-22.7	4/9/03	11:00		47	3.1		0.807	0.649	0.01 U	0.138	0.0612	2.4	2.1	
32WAL-22.7	4/24/03	12:35		58.6	9.3		0.675	0.565	0.01 U	0.093	0.0522	1.9	1.5	
32WAL-22.7	5/29/03	13:20		78.2	4.3		0.825	0.638	0.054	0.169	0.0849	1.6	1.4	
32WAL-22.7	6/26/03	15:05		145	2.9		0.352	0.139	0.025	0.103		2.4		
32WAL-27.4	6/26/02	12:20		92.1			0.504	0.308	0.049	0.109	0.08			
32WAL-27.4	7/10/02	14:30		91.6	3.5		0.274	0.118	0.022	0.1	0.0732			
32WAL-27.4	7/31/02	13:15			1.6		0.154	0.011	0.01 U	0.124	0.116	1.9	1.7	
32WAL-27.4	8/15/02	12:35		114	1.5		0.155	0.028	0.016	0.138	0.103			
32WAL-27.4	9/5/02	10:50			2.5 J		0.099	0.01 UJ	0.01 U	0.11	0.0831	1.7	1.6	
32WAL-27.4	9/18/02	12:25			2.7 J		0.16	0.059	0.01 U	0.098	0.0731	1.6	1.6	

Table B-2. Results for nutrient and pH-related parameters for the Walla Walla River basin TMDL. Bold type indicates periphyton chlorophyll a data.

Station ID	Date	Time	Rep-licate	Alkalinity mg/L	Chlor. a ug/L	BOD mg/L	TPN mg/L	NO2/NO3 mg/L	NH3 mg/L	TP mg/L	Ortho-phos mg/L	TOC mg/L	DOC mg/L	Comments
32WAL-27.4	10/17/02	10:50		99.8	1.7		0.376	0.284	0.01 U	0.081	0.0507	1.7	1.8	
32WAL-27.4	11/21/02	11:35		92.1	4.7		1.7	1.52	0.01 U	0.153	0.13	2.5	2.4	
32WAL-27.4	1/16/03	12:50		52.8	1.6		0.782	0.723	0.01 U	0.123	0.0939	2.2	1.9	
32WAL-27.4	3/13/03	10:00		32			0.439	0.347	0.01 U	0.36	0.058	3.1	2.9	
32WAL-27.4	4/9/03	10:35		40	3.1		0.603	0.48	0.01 U	0.106	0.0583	2.9	1.7	
32WAL-27.4	4/24/03	12:00			10.7		0.496	0.397	0.01 U	0.092	0.0507	1.7	1.4	
32WAL-27.4	5/29/03	12:05			6.7		0.519	0.544	0.023	0.14	0.0825	1.4	1	
32WAL-27.4	6/26/03	13:55					0.265	0.082	0.018	0.097		1.9	2	
32WAL-29.3	7/31/02	13:50			4.6		0.216	0.072	0.02	0.111	0.0994			
32WAL-29.3	9/5/02	9:55			3.8 J		0.19	0.104 J	0.01 U	0.095	0.0693			
32WAL-29.3	9/18/02	11:10			5.5 J		0.241	0.145	0.01 U	0.1	0.0672			
32WAL-29.3	4/24/03	11:25			10.7		0.503	0.412	0.01 U	0.096	0.0547			
32WAL-29.3	5/29/03	11:20			7.6		0.586	0.567	0.018	0.144	0.0837			
32WAL-29.3	6/26/03	13:16			22.7		0.344	0.134	0.02	0.094				
32WAL-32.8	6/26/02	11:00		70.8			0.982	0.819	0.027	0.129	0.098	1.6	1.5	
32WAL-32.8	7/10/02	12:55		72.8	6.3		0.7	0.569	0.034	0.102	0.0705	1.4	1.2	
32WAL-32.8	7/31/02	14:15		64.4	5.1		0.384	0.259	0.019	0.093	0.076	1.7	1.5	
32WAL-32.8	10/17/02	9:55		71.4										
32WAL-32.8	1/16/03	10:20		50										
32WAL-32.8	3/13/03	9:35		30										
32WAL-32.8	4/9/03	10:10		38										
32WAL-32.8	4/24/03	11:05		46	6.3		0.55	0.46	0.01 U	0.092	0.0576	1.7	1.4	
32WAL-32.8	5/29/03	10:40		51.8	5.3		0.661	0.55	0.018	0.137	0.0803	1.2	1	
32WAL-32.8	6/26/03	12:35		75.3			0.64	0.443	0.027	0.121		1.9	1.7	
32WAL-34.0	9/5/02	9:40		63.5	4.6 J		0.371	0.303 J	0.012	0.108	0.0742	1.4	1.3	
32WAL-34.0	9/18/02	10:45		57.3	2.9 J		0.349	0.263	0.01 U	0.089	0.0554	1.4	1.3	
32WAL-35.2	8/15/02	13:30		63.7	3		0.404	0.332	0.013	0.088	0.0707	1.3	1.4	
32WAL-35.2	9/18/02	9:50			4.3 J		0.325	0.256	0.01 U	0.09	0.0547	1.5	1.3	
32WAL-38.7	6/26/02	9:30		49.8			0.533	0.407	0.028	0.056	0.0415	1.1	1 U	
32WAL-38.7	7/10/02	11:30		55.6	3.3		0.52	0.45	0.022	0.052	0.035	1 U	1 U	
32WAL-38.7	7/10/02	11:30			**1250**									stream ctr
32WAL-38.7	7/10/02	11:30			**1260**									right bank
32WAL-38.7	7/10/02	11:30			**89.2**									left bank
32WAL-38.7	7/31/02	15:45		57.1	3.6		0.438	0.343	0.019	0.056	0.0486	1	1 U	
32WAL-38.7	8/15/02	15:05		56.1	10.2		0.384	0.323	0.016	0.062	0.0466	1.2	1.1	
32WAL-38.7	8/15/02	15:05			**1180**									left bank

Table B-2. Results for nutrient and pH-related parameters for the Walla Walla River basin TMDL. Bold type indicates periphyton chlorophyll a data.

Station ID	Date	Time	Rep-licate	Alkalinity mg/L	Chlor. a ug/L	BOD mg/L	TPN mg/L	NO2/NO3 mg/L	NH3 mg/L	TP mg/L	Ortho-phos mg/L	TOC mg/L	DOC mg/L	Comments
32WAL-38.7	8/15/02	15:10	Y		**1460**									left bank
32WAL-38.7	8/15/02	15:15			**681**									stream ctr
32WAL-38.7	8/15/02	15:20	Y		**1700**									stream ctr
32WAL-38.7	8/15/02	15:25			**1270**									right bank
32WAL-38.7	8/15/02	15:30	Y		**1120**									right bank
32WAL-38.7	9/5/02	8:40		55.3	4.6 J		0.376	0.332 J	0.012	0.051	0.03	1 U	1 U	
32WAL-38.7	9/5/02	8:40	Y									1 U	1 U	
32WAL-38.7	9/18/02	8:45		52	1.7 J		0.324	0.268	0.01 U	0.065	0.0356	1.1	1	
32WAL-38.7	10/17/02	9:25		55.4	1.9		0.458	0.412	0.01 U	0.062		1 U	1 U	
32WAL-38.7	11/21/02	9:15		52.8	5		0.472	0.398	0.01 U	0.059	0.0363	1.5	1.3	
32WAL-38.7	1/16/03	9:20		36	1.8		0.281	0.217	0.01 U	0.06	0.0382	1.6	1.6	
32WAL-38.7	3/13/03	9:05		25	3.6		0.211	0.126	0.01 U	0.327	0.0356	2.7	2.9	
32WAL-38.7	4/9/03	9:45		29	1.4		0.18	0.118	0.01 U	0.056	0.029	1.9	1.6	
32WAL-38.7	4/24/03	9:15		30	7.8		0.1	0.052	0.01 U	0.049	0.022	1.5	1.4	
32WAL-38.7	4/24/03	9:15	Y									1.6	1.4	
32WAL-38.7	5/29/03	8:45		32	4.2 J		0.172	0.102	0.013	0.077	0.027	1 U	1 U	
32WAL-38.7	5/29/03	8:45	Y									1 U	1 U	
32WAL-38.7	6/26/03	10:15		65.6	6.5 J		0.749	0.644	0.015	0.058		1.1	1.1	
32WAL-38.7	6/26/03	10:15	Y									1.1	1.1	
32WAL-WWTP	12/2/02	15:45		60.1		3 U	8.38	7.63	0.283	2.4	2.33	5.6	5.3	
32WAL-WWTP	12/2/02	15:45	Y			3 U								
32WAL-WWTP	1/16/03	11:00		69.5		2 U	4.92	4.79	0.01 U	1.14	1.1	4.3	4.29	
32WAL-WWTP	1/16/03	11:00	Y			2 U								
32WAL-WWTP	2/24/03	10:30		75.9		3 U	6.21	5.66	0.42	1.86	1.88	4.3	3.9	
32WAL-WWTP	3/12/03	11:50		74.9		2 U	5.21	4.85	0.012	2	1.97	3.7	3.4	
32WAL-WWTP	4/8/03	12:50		65		4 U	8.07	7.2	0.033	2.16	2.09	3.8	3.6	
32YEL-00.2	6/26/02	10:00					0.447	0.482	0.016	0.1	0.0488			
32YEL-00.2	7/11/02	16:05			2.1 J		0.752 J	0.599 J	0.017 J	0.096 J	0.0532 J			
32YEL-00.2	8/1/02	13:50			1.7		0.519	0.437	0.01 U	0.079	0.0533			
32YEL-00.2	8/14/02	15:05			1.7		0.693	0.571	0.01	0.085	0.0619			
32YEL-00.2	9/4/02	13:25			2.2 J		0.292	0.246 J	0.01 U	0.076	0.0432	1.3	1.3	
32YEL-00.2	9/19/02	13:20			1.9 J		0.262	0.205	0.01 U	0.08	0.0423			
32YEL-00.2	4/23/03	14:00			6.2		1.15	1.05	0.01 U	0.082	0.0367	2.4	1.7	
32YEL-00.2	5/28/03	14:55			4.2		1.1	0.968	0.019	0.122	0.0496	1.6	1 U	
32YEL-00.2	6/25/03	14:45			3.6		0.653	0.557	0.01	0.08	0.0399	1.1	1 U	

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Appendix C

Field Measurements

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Table C-1. Field measurements for the Walla Walla TMDL. All except Winkler DO were taken using a Hydrolab® (HL).

Station ID	Date	Time	Temp (°C)	pH	Cond (uS/cm)	Hydrolab DO (mg/L)	Winkler DO (mg/L)	HL and Winkler DO Difference	HL and Winkler DO RSD%	Comments
32COL-GARR	8/1/02	15:00	24.05	7.06	480	1.76	2.00	0.24	9.03	
32COL-GARR	9/10/02	14:35		7.73	352					
32COL-GARR	9/10/02	8:55	19.50	7.53	197					
32COL-GARR	9/11/02	9:30		7.28	498					
32COL-WWTP	12/2/02	14:00	16.26	8.37	345	10.05	9.65	0.40	2.87	
32COL-WWTP	12/2/02	8:40	16.28	8.24	352	10.05				
32COL-WWTP	12/3/02	9:00	16.37	8.07	343	9.90	9.61	0.29	2.10	
32COL-WWTP	1/15/03	13:05	15.62	7.11	311	7.31				
32COL-WWTP	2/25/03	14:25	13.60	7.13			8.95			
32COL-WWTP	3/12/03	12:50	15.98	7.14	360	8.75				
32COL-WWTP	4/8/03	14:50	17.29	6.92	375	8.50				
32COL-WWTP	5/7/03	14:15	18.49	7.28	429	8.65	8.18	0.47	3.95	
32COL-WWTP	6/11/03	14:10	22.30	8.30	471	8.22	9.72	1.50	11.82	
32COP-00.5	7/30/02	15:20	22.27	7.64	163	8.28				
32COP-00.5	9/3/02	13:25	18.54	7.76	152	8.70				
32COP-00.5	4/21/03	14:45	13.76	9.04	105	11.67	11.12	0.55	3.41	
32COP-00.5	5/26/03	14:00	15.43	8.06	128	10.82				
32COP-00.5	6/23/03	13:46	15.40	7.72	143	10.08	10.00	0.08	0.56	
32COT-01.0	8/1/02	13:10	13.98	7.77	121	10.42	10.15	0.27	1.86	
32COT-01.0	9/4/02	13:05	15.64	7.34	124	6.10				
32COT-01.0	4/23/03	13:00	14.16	8.62	66	10.75				
32COT-01.0	5/28/03	14:15	20.85	7.33	101	8.90				
32COT-01.0	6/25/03	14:10	14.44	7.47	139	10.60	10.24	0.36	2.44	
32DAY-WWTP	7/30/02	10:55	19.46	6.66	440	5.66	5.24	0.42	5.45	
32DAY-WWTP	9/10/02	12:25		7.37	304					
32DAY-WWTP	12/2/02	12:15	9.40	7.48	498	5.80	5.40	0.40	5.05	
32DAY-WWTP	12/3/02	12:00	9.09	7.36	468	7.10	6.65	0.45	4.63	
32DAY-WWTP	1/14/03	11:50	10.10	7.55	398	7.49				
32DAY-WWTP	2/25/03	11:55					8.50			sampled at outflow
32DAY-WWTP	2/25/03	11:55					7.40			sampled in UV building
32DAY-WWTP	3/11/03	10:15	10.65	7.91	474	9.50	7.95	1.55	12.56	
32DAY-WWTP	4/7/03	11:05	10.59	7.88	469	7.41	6.60	0.81	8.18	
32DAY-WWTP	5/6/03	10:30	12.93	7.72	815	6.00	5.70	0.30	3.63	
32DAY-WWTP	6/10/03	12:00	18.72	7.43	463	3.84	4.12	0.28	4.97	
32DRY-00.5	7/31/02	12:55	16.30	7.20	604	8.27				
32DRY-00.5	9/5/02	10:25	13.45	7.36	559	6.09				
32DRY-00.5	4/24/03	11:40	12.87	8.05	267	10.10	10.21	0.11	0.77	
32DRY-00.5	5/29/03	11:55	17.32	7.42	560	8.00				
32DRY-00.5	6/26/03	13:39	19.10	7.80	580	10.25				
32GAR-00.5	6/27/02	14:55	24.60	7.24	260	5.48	4.80	0.68	9.35	
32GAR-00.5	7/11/02	16:45	23.58	7.48	319	3.95				

Table C-1. Field measurements for the Walla Walla TMDL. All except Winkler DO were taken using a Hydrolab® (HL).

Station ID	Date	Time	Temp (°C)	pH	Cond (uS/cm)	Hydrolab DO (mg/L)	Winkler DO (mg/L)	HL and Winkler DO Difference	HL and Winkler DO RSD%	Comments
32GAR-00.5	8/1/02	11:25	18.14	7.42	447	5.70	5.35	0.35	4.48	
32GAR-00.5	8/14/02	15:05	21.76	7.40	472	4.10				
32GAR-00.5	9/4/02	13:50	18.70	7.57	468	6.10				
32GAR-00.5	9/19/02	13:50	18.26	7.63	500	6.42				
32GAR-00.5	10/16/02	14:35	14.02	7.48	436	7.50				
32GAR-00.5	11/20/02	14:40	13.54	7.13	338	3.41	3.50	0.09	1.84	
32GAR-00.5	1/15/03	13:40	9.57	7.27	195	9.33	8.78	0.55	4.29	
32GAR-00.5	3/12/03	13:15	12.40	7.62	222	10.17	9.10	1.07	7.85	
32GAR-00.5	4/8/03	14:15	15.19	7.56	212	10.32				
32GAR-00.5	4/23/03	14:40	15.17	7.48	211	9.27	9.37	0.10	0.76	
32GAR-00.5	5/7/03	15:00	13.97	7.77	217	10.90				
32GAR-00.5	5/28/03	15:30	20.85	7.54	242	8.20				
32GAR-00.5	6/11/03	14:40	21.20	7.59	361	7.05				
32GAR-00.5	6/25/03	15:10	20.32	7.48	332	7.50				
32MIL-00.5	6/27/02	16:15	25.09	8.41	273	9.91	11.00	1.09	7.37	
32MIL-00.5	7/11/02	9:25	21.69	7.59	337	9.15	8.60	0.55	4.38	
32MIL-00.5	7/11/02	9:50	22.00	7.70	337	9.50				
32MIL-00.5	7/12/02	12:30	24.95	7.83	341	10.43	9.65	0.78	5.49	
32MIL-00.5	8/1/02	10:15	21.35	6.87	373	7.05	7.30	0.25	2.46	
32MIL-00.5	8/14/02	15:55	27.25	7.70	391	8.20	8.72	0.52	4.35	
32MIL-00.5	8/14/02	9:00	20.19	7.40	383	5.63	5.88	0.25	3.07	
32MIL-00.5	8/15/02	16:10	27.20	7.41	394	7.24	7.90	0.66	6.16	
32MIL-00.5	9/4/02	15:40	21.37	7.61	380	9.33	8.50	0.83	6.58	
32MIL-00.5	9/18/02	11:50	18.16	7.69	414	8.80	8.83	0.03	0.24	
32MIL-00.5	9/19/02	15:50	20.33	7.91	413	10.21	10.00	0.21	1.47	
32MIL-00.5	9/19/02	9:05	16.42	7.53	412	7.00	6.92	0.08	0.81	
32MIL-00.5	10/16/02	15:40	12.35	7.91	420	12.35				
32MIL-00.5	11/20/02	15:15	11.06	7.95	285	10.84				
32MIL-00.5	1/15/03	14:15	7.24	7.63	117	12.24				
32MIL-00.5	3/12/03	14:55	9.31	7.60	63	11.25	10.60	0.65	4.21	
32MIL-00.5	4/8/03	15:55	13.22	8.46	82	12.00				
32MIL-00.5	4/23/03	17:00	14.14	8.61	110	10.43				
32MIL-00.5	5/7/03	16:10	11.88	8.00	87	11.18	10.61	0.57	3.70	
32MIL-00.5	5/8/03	10:30	9.35	7.88	90					
32MIL-00.5	5/28/03	17:30	21.51	7.97	131	9.10	8.70	0.40	3.18	
32MIL-00.5	6/11/03	16:20	23.01	8.53	294	11.73	11.13	0.60	3.71	
32MIL-00.5	6/25/03	17:05	22.23	7.91	358	11.30	10.50	0.80	5.19	
32MIL-02.8	6/27/02	15:30	22.77	7.69	296	10.10				
32MIL-02.8	7/11/02	10:55	20.11	7.60	362	10.09				
32MIL-02.8	8/1/02	10:55	17.60	7.38	433	10.97				
32MIL-02.8	8/14/02	15:25	20.74	8.02	439	11.70				
32MIL-02.8	9/4/02	15:10	17.22	7.88	425	11.91				
32MIL-02.8	9/19/02	15:00	16.88	7.69	458	10.80				

Table C-1. Field measurements for the Walla Walla TMDL. All except Winkler DO were taken using a Hydrolab® (HL).

Station ID	Date	Time	Temp (°C)	pH	Cond (uS/cm)	Hydrolab DO (mg/L)	Winkler DO (mg/L)	HL and Winkler DO Difference	HL and Winkler DO RSD%	Comments
32MIL-02.8	10/16/02	15:10	13.04	7.50	434	11.02	10.67	0.35	2.28	
32MIL-02.8	11/20/02	15:45	11.68	7.33	279	9.39	9.60	0.21	1.56	
32MIL-02.8	1/15/03	15:00	7.33	7.59	108	12.45	11.21	1.24	7.41	
32MIL-02.8	3/12/03	14:40	9.35	7.83	65	11.55				
32MIL-02.8	4/8/03	15:35	12.96	8.26	77	11.90	10.90	1.00	6.20	
32MIL-02.8	4/23/03	16:15	14.39	8.70	99	10.35	10.41	0.06	0.41	
32MIL-02.8	5/7/03	15:35	11.84	7.86	81	11.25	10.31	0.94	6.17	
32MIL-02.8	5/28/03	16:50	21.66	8.20	124	9.05	8.42	0.63	5.10	
32MIL-02.8	6/11/03	15:45	20.70	8.18	320	12.25				
32MIL-02.8	6/25/03	16:30	19.89	7.56	307	10.44				
32MIL-04.8	6/27/02	13:10	25.40	8.87	188	8.12				
32MIL-04.8	7/11/02	17:10	28.80	9.50	246	7.85				
32MIL-04.8	8/1/02	15:35	23.04	8.53	280	10.85				
32MIL-04.8	8/14/02	14:15	22.99	7.74	308	10.04				
32MIL-04.8	9/4/02	14:20	18.47	7.50	312	10.70	10.60	0.10	0.66	
32MIL-04.8	9/19/02	14:30	18.27	7.53	343	9.40	9.14	0.26	1.98	
32MIL-04.8	10/16/02	12:40	11.57	7.34	328	10.60				
32MIL-04.8	11/20/02	13:20	11.80	8.14	148	10.67				
32MIL-04.8	1/15/03	11:45	6.94	7.83	89	13.12	11.75	1.37	7.79	
32MIL-04.8	3/12/03	12:15	8.55	7.59	59	12.00	11.00	1.00	6.15	
32MIL-04.8	4/8/03	12:20	10.64	8.00	76	11.75	10.90	0.85	5.31	
32MIL-04.8	4/23/03	15:30	15.02	8.89	77	9.81				
32MIL-04.8	5/6/03	7:55	7.29	7.79	68	12.53	11.57	0.96	5.63	
32MIL-04.8	5/7/03	12:40	10.23	8.08	68	11.40	10.75	0.65	4.15	
32MIL-04.8	5/8/03	10:48	9.02	8.02	70	11.75	11.26	0.49	3.01	
32MIL-04.8	5/28/03	16:10	22.80	9.03	90	9.15				
32MIL-04.8	6/11/03	15:10	22.87	9.03	217	10.59				
32MIL-04.8	6/25/03	15:42	21.90	7.38	284	9.70				
32MIL-06.7	6/27/02	12:30	23.30	8.21	123	8.75	8.70	0.05	0.41	
32MIL-06.7	7/11/02	15:35	26.55	7.98	137	8.24				
32MIL-06.7	8/1/02	16:10	22.60	8.15	171	9.75	9.40	0.35	2.58	
32MIL-06.7	8/14/02	13:50	22.40	8.53	167	10.04				
32MIL-06.7	9/4/02	11:50	17.50	8.67	181	11.95	10.50	1.45	9.13	
32MIL-06.7	9/19/02	12:40	18.33	8.55	198	11.21				
32MIL-06.7	10/16/02	11:40	13.22	8.49	181	11.51	10.90	0.61	3.85	
32MIL-06.7	11/20/02	12:00	10.63	8.04	125	11.21				
32MIL-06.7	1/15/03	10:45	5.35	7.75	63	13.60				
32MIL-06.7	3/12/03	10:30	7.67	7.76	51	11.92	11.20	0.72	4.40	
32MIL-06.7	4/8/03	12:00	10.23	7.90	59	12.05				
32MIL-06.7	4/23/03	12:10	12.78	8.11	70	10.50	11.31	0.81	5.25	
32MIL-06.7	5/7/03	11:50	10.00	7.77	63	11.75	10.82	0.93	5.83	
32MIL-06.7	5/28/03	13:15	21.66	8.31	76	9.15	8.62	0.53	4.22	
32MIL-06.7	6/11/03	12:55	20.22	8.21	187	9.55	9.50	0.05	0.37	

Table C-1. Field measurements for the Walla Walla TMDL. All except Winkler DO were taken using a Hydrolab® (HL).

Station ID	Date	Time	Temp (°C)	pH	Cond (uS/cm)	Hydrolab DO (mg/L)	Winkler DO (mg/L)	HL and Winkler DO Difference	HL and Winkler DO RSD%	Comments
32MIL-06.7	6/25/03	12:20	20.23	8.37	201	10.20				
32MIL-07.1	10/16/02	11:30	12.65	8.08	203	10.50				
32MIL-07.2	6/25/03	12:45	18.30	8.11		9.20				
32MIL-07.3	10/16/02	11:05	12.65	8.05	202	10.65				
32MIL-07.4	10/16/02	10:40	12.56	7.96	200	10.70				
32MIL-08.5	6/27/02	11:35	26.99	8.40	86	7.80				
32MIL-08.5	3/12/03	10:20	7.38	7.76	50					
32MIL-08.5	4/8/03	11:25	9.55	7.85	57	12.20				
32MIL-08.5	4/23/03	11:25	12.08	7.91	62	10.60				
32MIL-08.5	5/7/03	11:25	9.57	7.91	60					
32MIL-08.5	5/28/03	12:00	21.02	8.69	69	9.80				
32MIL-08.9	8/15/02	8:15	22.50	7.42	90	5.58				
32MIL-11.5	6/27/02	10:50	20.80	8.43	75	9.10	9.00	0.10	0.78	
32MIL-11.5	7/11/02	14:40	27.08	8.66	80	8.48				
32MIL-11.5	8/1/02	17:40	24.78	8.47	82	8.32	8.21	0.11	0.94	
32MIL-11.5	8/14/02	12:25	22.83	8.58	82	9.01				
32MIL-11.5	8/15/02	8:25	19.22	8.06	82	9.07				
32MIL-11.5	9/4/02	10:40	15.80	8.39	78	9.96				
32MIL-11.5	9/19/02	11:40	16.03	8.47	80	10.15				
32MIL-11.5	10/16/02	10:10	8.64	8.14	84	11.85				
32MIL-11.5	11/20/02	10:50	8.51	8.11	75	11.40	11.51	0.11	0.68	
32MIL-11.5	1/15/03	10:15	4.50	7.89	56	13.52	12.62	0.90	4.87	
32MIL-11.5	3/12/03	9:50	6.88	7.58	48	11.95				
32MIL-11.5	4/8/03	11:00	7.93	7.73	55	12.83	11.45	1.38	8.04	
32MIL-11.5	4/23/03	10:45	9.54	8.23	61	11.00	11.11	0.11	0.70	
32MIL-11.5	5/6/03	8:45	6.94	7.89	59	13.21	11.48	1.73	9.91	
32MIL-11.5	5/7/03	10:50	7.78	8.04	58	12.44	11.45	0.99	5.86	
32MIL-11.5	5/8/03	8:37	6.61	7.83	60	12.80	11.90	0.90	5.15	
32MIL-11.5	5/28/03	11:40	16.12	8.57	65	11.20				
32MIL-11.5	6/11/03	11:35	18.28	8.90	73	9.50	9.57	0.07	0.52	
32MIL-11.5	6/22/03	18:43	18.11	8.62	76	9.10	9.11	0.01	0.08	
32MIL-11.5	6/24/03	9:03	14.42	8.23	78	10.30	10.10	0.20	1.39	
32MIL-11.5	6/25/03	10:50	17.71	8.45	80	9.80	9.79	0.01	0.07	
32MIL-11.5	6/27/03	10:22	19.10	8.37	80	9.55	9.42	0.13	0.97	
32MIL-12.8	6/27/02	10:30	18.24	7.75	73	9.25				
32MIL-12.8	7/11/02	14:10	22.84	7.85	77	8.45				
32MIL-12.8	8/1/02	18:15	21.38	7.56	77	8.46				
32MIL-12.8	8/14/02	12:10	19.60	7.98	77	8.90				
32MIL-12.8	8/15/02	8:45	16.78	7.70	78	8.85				
32MIL-12.8	9/4/02	10:00	14.28	8.08	74	9.83				
32MIL-12.8	9/19/02	11:10	13.91	7.96	78	10.25	10.00	0.25	1.75	
32MIL-12.8	10/16/02	9:50	8.12	7.91	82	11.70				
32MIL-12.8	11/20/02	10:35	7.81	7.79	72	11.20				

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Station ID	Date	Time	Temp (°C)	pH	Cond (uS/cm)	Hydrolab DO (mg/L)	Winkler DO (mg/L)	HL and Winkler DO Difference	HL and Winkler DO RSD%	Comments
32MIL-12.8	1/15/03	9:50	3.99	7.62	55	13.07				
32MIL-12.8	3/12/03	9:35	6.71	7.53	48	11.90				
32MIL-12.8	4/8/03	10:15	7.68	7.95	56	12.66				
32MIL-12.8	4/23/03	10:20	8.66	8.62	59	11.70				
32MIL-12.8	5/7/03	10:30	7.40	8.23	57	13.00				
32MIL-12.8	5/28/03	11:10	14.68	7.90	64	10.85	9.81	1.04	7.12	
32MIL-12.8	6/11/03	11:15	16.20	8.07	71	9.68				
32MIL-12.8	6/25/03	10:15	15.16	8.06	76	10.50				
32MIL-21.1	6/27/02	9:30	13.16	7.72	62	10.20	9.41	0.79	5.70	
32MIL-21.1	7/11/02	13:10	18.21	7.97	69	9.13	8.60	0.53	4.23	
32MIL-21.1	7/12/02	13:30	18.88	8.08	69	8.96	8.60	0.36	2.90	
32MIL-21.1	8/1/02	19:10	14.20	7.52	70	9.19	9.05	0.14	1.09	
32MIL-21.1	8/14/02	11:10	13.60	8.00	68	9.49	9.60	0.11	0.81	
32MIL-21.1	8/15/02	9:10	11.64	7.88	68	10.07	10.01	0.06	0.42	
32MIL-21.1	9/4/02	9:30	10.24	8.03	64	10.20	9.62	0.58	4.14	
32MIL-21.1	9/19/02	10:15	9.64	7.91	69	10.80				
32MIL-21.1	10/16/02	9:20	5.98	7.86	73	12.05	11.43	0.62	3.73	
32MIL-21.1	11/20/02	10:15	6.97	7.88	64	11.20	11.37	0.17	1.07	
32MIL-21.1	1/15/03	9:15	4.00	7.57	48	12.87	12.11	0.76	4.30	
32MIL-21.1	3/12/03	9:10	5.67	7.32	41	12.14	11.20	0.94	5.70	
32MIL-21.1	4/8/03	9:45	5.96	7.71	44	12.70	11.50	1.20	7.01	
32MIL-21.1	4/23/03	8:55	6.63	7.85	48	11.30	11.14	0.16	1.01	
32MIL-21.1	5/6/03	9:20	5.75	7.64	50	12.52	11.41	1.11	6.56	
32MIL-21.1	5/7/03	10:00	5.73	7.51	50	12.52	11.40	1.12	6.62	
32MIL-21.1	5/8/03	8:05	5.09	7.69	51	12.70	11.68	1.02	5.92	
32MIL-21.1	5/28/03	10:30	11.43	7.94	53	11.55				
32MIL-21.1	6/11/03	10:50	12.29	7.87	60	10.20				
32MIL-21.1	6/22/03	19:30	11.22	7.71	65	10.10	9.95	0.15	1.06	
32MIL-21.1	6/24/03	9:32	9.67	7.89	66	10.95	10.50	0.45	2.97	
32MIL-21.1	6/25/03	9:32	10.49	7.80	66	10.70	10.50	0.20	1.33	
32MIL-21.1	6/27/03	9:53	11.81	7.80	67	10.45	10.10	0.35	2.41	
32MUD-00.5	7/31/02	12:20	23.20	8.53	170	11.70	11.56	0.14	0.85	
32MUD-00.5	9/5/02	11:20	16.34	8.03	270	8.97				
32MUD-00.5	9/18/02	12:50	17.13	8.44	237	11.14				
32MUD-00.5	4/24/03	13:35	13.42	8.43	281	11.95				
32MUD-00.5	5/29/03	12:20	23.75	8.37	341	11.38	11.17	0.21	1.32	
32NFT-00.0	6/25/02	10:30	14.93	7.77	64	10.06				
32NFT-00.0	7/9/02	11:25	16.46	7.63	75	9.41	9.30	0.11	0.83	
32NFT-00.0	7/30/02	11:45	18.95	7.55	77	9.26				
32NFT-00.0	8/13/02	8:56	14.50	7.60	75	9.58	9.51	0.07	0.52	
32NFT-00.0	8/14/02	9:55	15.87	7.79	71	9.29	9.40	0.11	0.83	
32NFT-00.0	9/3/02	9:45	14.81	7.84	70	9.58	9.60	0.02	0.15	
32NFT-00.0	9/17/02	9:10	12.97	7.73	74	9.75	9.54	0.21	1.54	

Table C-1. Field measurements for the Walla Walla TMDL. All except Winkler DO were taken using a Hydrolab® (HL).

Station ID	Date	Time	Temp (°C)	pH	Cond (uS/cm)	Hydrolab DO (mg/L)	Winkler DO (mg/L)	HL and Winkler DO Difference	HL and Winkler DO RSD%	Comments
32NFT-00.0	10/15/02	10:00	6.47	7.83	75	12.25				
32NFT-00.0	11/19/02	9:30	7.34	7.66	65	12.00	11.26	0.74	4.50	
32NFT-00.0	1/14/03	10:10	5.01	7.69	57	12.80	11.79	1.01	5.81	
32NFT-00.0	3/11/03	9:20	5.74	7.52	60	12.35	10.60	1.75	10.78	
32NFT-00.0	4/7/03	9:22	4.40	7.85	57	13.28	12.20	1.08	5.99	
32NFT-00.0	4/21/03	9:50	8.45	8.67	59	12.62	11.82	0.80	4.63	
32NFT-00.0	5/6/03	11:55	8.76	8.31	51	12.60				
32NFT-00.0	5/26/03	10:25	11.42	8.07	57	10.80	9.53	1.27	8.83	
32NFT-00.0	5/27/03	19:36	16.56	7.57	62	9.80	8.40	1.40	10.88	
32NFT-00.0	6/10/03	10:45	15.25	8.04	68	9.60	9.68	0.08	0.59	
32NFT-00.0	6/23/03	10:30	13.30	8.23	71	10.45	10.50	0.05	0.34	
32NFT-08.9	5/26/03	9:20	8.77	7.63	52	11.30	10.52	0.78	5.06	
32NFT-08.9	5/27/03	19:14	11.66	7.38	53	11.65	8.40	3.25	22.92	
32PAT-00.1	7/30/02	13:05	17.80	7.08	479	8.85				
32PAT-00.1	9/3/02	11:40	15.56	7.42	528	7.35				
32PAT-00.1	4/21/03	12:55	12.80	8.75	126	12.40	9.90	2.50	15.85	
32PAT-00.1	5/26/03	11:10	13.81	7.97	195	10.85	10.39	0.46	3.06	
32PAT-00.1	6/23/03	12:00	13.93	7.94	334	12.44	12.21	0.23	1.32	
32PIN-01.4	7/31/02	12:10	23.20	7.76	971	8.08				
32PIN-01.4	4/24/03	12:55	13.06	8.72	241	11.32	11.89	0.57	3.47	
32PIN-01.4	5/29/03	13:00	23.05	7.95	297	9.30				
32PIN-01.4	6/26/03	14:25	23.94	8.48	675	8.31				
32RUS-00.1	8/1/02	12:45	13.45	7.92	367	7.57				
32RUS-00.1	9/4/02	12:45	13.08	8.31	349	9.63				
32RUS-00.1	4/23/03	13:20	11.25	7.97	261	10.75	10.57	0.18	1.19	
32RUS-00.1	5/28/03	13:50	17.25	8.06	372	9.80				
32RUS-00.1	6/25/03	13:50	16.41	8.22	473	9.15				
32SFT-00.0	6/25/02	10:43	17.32	7.33	57	8.94				
32SFT-00.0	7/9/02	12:00	18.57	7.37	64	8.77				
32SFT-00.0	7/30/02	11:55	19.15	6.99	82	8.68				
32SFT-00.0	8/13/02	9:10	16.50	7.14	85	8.27				
32SFT-00.0	9/3/02	9:50	16.00	7.29	89	9.55				
32SFT-00.0	9/17/02	9:30	14.40	7.11	94	8.47				
32SFT-00.0	10/15/02	10:30	9.80	7.32	76	11.13	10.59	0.54	3.52	
32SFT-00.0	11/19/02	10:00	8.27	7.26	58	11.06				
32SFT-00.0	1/14/03	10:30	4.82	7.41	44	12.80				
32SFT-00.0	4/21/03	10:25	9.90	8.88	50	12.25				
32SFT-00.0	5/6/03	12:05	8.08	8.83	59	12.60	11.86	0.74	4.28	
32SFT-00.0	5/26/03	10:10	12.52	7.76	51	10.39				
32SFT-00.0	6/10/03	10:30	16.50	7.30	64	8.85				
32SFT-00.0	6/23/03	10:15	14.25	7.58	72	10.65				
32TOU-00.5	6/25/02	17:10	26.51	8.10	98	8.20	8.19	0.01	0.09	
32TOU-00.5	7/9/02	17:50	26.22	8.17	112	8.95	8.70	0.25	2.00	

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Station ID	Date	Time	Temp (°C)	pH	Cond (uS/cm)	Hydrolab DO (mg/L)	Winkler DO (mg/L)	HL and Winkler DO Difference	HL and Winkler DO RSD%	Comments
32TOU-00.5	7/29/02	16:45	28.02	8.64	130	10.55	10.30	0.25	1.70	
32TOU-00.5	8/13/02	14:50	23.79	7.85	147	8.21				
32TOU-00.5	9/2/02	13:10	20.83	7.66	155	7.71	7.58	0.13	1.20	
32TOU-00.5	9/17/02	17:15	18.43	8.12	152	10.04				
32TOU-00.5	10/15/02	15:15	9.92	8.69	126	14.12				
32TOU-00.5	11/19/02	15:35	8.47	7.99	100	12.45	11.70	0.75	4.39	
32TOU-00.5	1/14/03	16:15					12.35			
32TOU-00.5	3/11/03	13:30	8.21	7.66	64	11.90	11.40	0.50	3.03	
32TOU-00.5	4/7/03	15:20	8.99	7.60	75	12.30	11.70	0.60	3.54	
32TOU-00.5	4/22/03	15:10	15.13	8.06	91	9.73				
32TOU-00.5	5/6/03	17:25	13.71	8.52	83	11.27				
32TOU-00.5	5/27/03	14:58	21.23	8.74	94	10.30	9.22	1.08	7.82	
32TOU-00.5	6/10/03	17:05	24.77	7.95	118	8.35				
32TOU-00.5	6/24/03	16:30	23.57	8.39	126	9.71	10.00	0.29	2.08	
32TOU-02.0	6/25/02	16:43	26.36	8.30	96	8.30	8.25	0.05	0.43	
32TOU-02.0	7/9/02	16:40	25.57	8.18	107	8.91	8.80	0.11	0.88	
32TOU-02.0	7/11/02	8:40	24.20	7.26	111	7.74				
32TOU-02.0	7/29/02	16:00	26.83	8.38	124	9.93				
32TOU-02.0	8/12/02	16:50	24.26	8.43	131	9.58	9.70	0.12	0.88	
32TOU-02.0	8/13/02	14:00	24.73	8.65	131	9.00	9.12	0.12	0.94	
32TOU-02.0	8/14/02	8:25	21.08	8.20	134	6.85	6.98	0.13	1.33	
32TOU-02.0	9/2/02	12:45	21.57	8.36	137	9.82				
32TOU-02.0	9/17/02	16:05	18.63	8.57	132	10.80	10.55	0.25	1.66	
32TOU-02.0	10/15/02	14:55	9.11	8.23	116	13.20	12.55	0.65	3.57	
32TOU-02.0	11/19/02	15:15	8.35	8.06	95	12.60				
32TOU-02.0	4/22/03	14:40	14.92	8.12	90	9.69	9.82	0.13	0.94	
32TOU-02.0	5/6/03	17:20		8.41						
32TOU-02.0	5/27/03	14:25	20.98	8.74	93	10.45				
32TOU-02.0	5/27/03	21:15	22.19	9.07	92	9.15	8.30	0.85	6.89	
32TOU-02.0	5/29/03	16:17	23.88	8.89	97		9.12			
32TOU-02.0	6/24/03	16:05	22.76	8.38	117	9.60				
32TOU-07.0	6/25/02	16:25	26.92	8.58	94	8.75				
32TOU-07.0	7/9/02	17:15	26.71	8.52	106	8.63				
32TOU-07.0	7/29/02	15:05	27.45	8.48	118	9.28	9.00	0.28	2.17	
32TOU-07.0	8/13/02	13:35	24.97	8.74	120	9.28				
32TOU-07.0	9/2/02	12:20	21.67	8.54	118	9.75				
32TOU-07.0	9/17/02	16:35	19.15	8.82	121	10.15				
32TOU-07.0	10/15/02	14:35	9.16	8.13	110	12.30				
32TOU-07.0	11/19/02	14:50	8.51	8.15	94	12.53	11.60	0.93	5.45	
32TOU-07.0	1/14/03	15:45				13.20				
32TOU-07.0	3/11/03	13:05	7.80	7.60	63	12.11				
32TOU-07.0	4/7/03	14:50	8.55	7.57	75	12.15				
32TOU-07.0	4/22/03	14:15	14.44	8.22	89	10.12				

Table C-1. Field measurements for the Walla Walla TMDL. All except Winkler DO were taken using a Hydrolab® (HL).

Station ID	Date	Time	Temp (°C)	pH	Cond (uS/cm)	Hydrolab DO (mg/L)	Winkler DO (mg/L)	HL and Winkler DO Difference	HL and Winkler DO RSD%	Comments
32TOU-07.0	5/6/03	17:10	13.26	8.59	81	11.55	10.73	0.82	5.20	
32TOU-07.0	5/27/03	14:00	21.17	8.99	92	10.92				
32TOU-07.0	6/10/03	16:35	25.04	9.03	106	9.80	9.58	0.22	1.61	
32TOU-07.0	6/24/03	14:45	22.55	8.83	110	10.20				
32TOU-14.2	7/29/02	14:20	26.05	8.36	112	9.84				
32TOU-14.2	9/2/02	11:55	20.56	8.63	111	9.99				
32TOU-14.2	4/22/03	14:00	13.10	8.09	87	10.55	10.30	0.25	1.70	
32TOU-14.2	5/27/03	13:35	19.83	8.80	88	12.25	11.41	0.84	5.02	
32TOU-14.2	6/24/03	15:35	22.34	8.95	109	10.85				
32TOU-17.8	6/25/02	15:40	25.40	8.56	94	9.16	9.45	0.29	2.20	
32TOU-17.8	7/9/02	16:00	25.30	8.40	103	9.24				
32TOU-17.8	7/29/02	13:35	25.44	8.32	111	9.65	9.50	0.15	1.11	
32TOU-17.8	8/12/02	17:35	25.00	8.84	112	9.37	9.55	0.18	1.35	
32TOU-17.8	8/13/02	12:00					9.60			
32TOU-17.8	9/2/02	11:15	20.38	8.75	108	10.10	9.19	0.91	6.67	
32TOU-17.8	9/17/02	14:50	18.02	8.87	114	11.05				
32TOU-17.8	10/15/02	13:40	8.84	8.27	108	12.35	11.91	0.44	2.56	
32TOU-17.8	11/19/02	14:05	8.09	8.08	93	12.66				
32TOU-17.8	1/14/03	15:05	5.49	7.93	75	13.40	12.11	1.29	7.15	
32TOU-17.8	3/11/03	12:35	7.35	7.61	63	12.19				
32TOU-17.8	4/7/03	13:30	7.52	7.60	76	12.60	11.60	1.00	5.84	
32TOU-17.8	4/22/03	13:30	12.78	8.09	86	10.48				
32TOU-17.8	5/6/03	16:40	12.62	9.02	84	12.95				
32TOU-17.8	5/27/03	20:40	21.40	9.08	91	9.81	9.90	0.09	0.65	
32TOU-17.8	5/27/03	12:35	18.74	8.63	86	11.55				
32TOU-17.8	5/29/03	15:40	22.09	9.11	91		11.76			
32TOU-17.8	6/10/03	16:10	24.06	8.36	106	8.95				
32TOU-17.8	6/24/03	14:00	21.60	8.53	110	9.65	10.50	0.85	5.97	
32TOU-25.0	7/29/02	12:50	24.55	8.34	108	9.91				
32TOU-25.0	9/2/02	10:35	18.65	8.49	105	10.65				
32TOU-25.0	9/17/02	13:50	16.77	8.73	112	11.23	11.04	0.19	1.21	
32TOU-25.0	4/22/03	12:15	11.93	8.20	89	10.75	10.65	0.10	0.66	
32TOU-25.0	5/6/03	16:15		9.20						
32TOU-25.0	5/27/03	12:00	18.37	8.72	89	12.00	11.20	0.80	4.88	
32TOU-25.0	6/24/03	13:07	20.26	8.64	108	11.55				
32TOU-30.6	7/29/02	11:15	22.81	7.98	105	9.55				
32TOU-30.6	9/2/02	10:10	18.02	8.15	102	9.62				
32TOU-30.6	9/17/02	13:10	16.50	8.51	110	10.39				
32TOU-30.6	4/22/03	11:45	11.36	8.01	88	10.75				
32TOU-30.6	5/27/03	11:30	17.56	8.07	89	10.26				
32TOU-30.6	6/24/03	12:42	20.51	8.76		11.11				
32TOU-34.2	6/25/02	14:30	24.46	8.73	87	9.41				
32TOU-34.2	7/9/02	15:13	24.83	9.05	95	10.00				

Table C-1. Field measurements for the Walla Walla TMDL. All except Winkler DO were taken using a Hydrolab® (HL).

Station ID	Date	Time	Temp (°C)	pH	Cond (uS/cm)	Hydrolab DO (mg/L)	Winkler DO (mg/L)	HL and Winkler DO Difference	HL and Winkler DO RSD%	Comments
32TOU-34.2	7/29/02	12:00	23.43	8.33	105	9.90	9.85	0.05	0.36	
32TOU-34.2	8/13/02	11:20	21.69	8.28	108	9.33				
32TOU-34.2	9/2/02	9:25	17.28	8.21	102	9.95				
32TOU-34.2	9/17/02	12:20	15.78	8.41	110	10.44	10.33	0.11	0.75	
32TOU-34.2	10/15/02	12:50	8.80	8.68	104	12.90				
32TOU-34.2	11/19/02	13:05	8.56	8.32	92	12.74				
32TOU-34.2	1/14/03	14:05	5.86	8.00	73	13.07				
32TOU-34.2	3/11/03	11:55	6.93	7.57	63	12.08	11.00	1.08	6.62	
32TOU-34.2	4/7/03	12:40	7.22	7.65	74	12.54				
32TOU-34.2	4/22/03	10:45	10.97	7.83	88	10.45	10.25	0.20	1.37	
32TOU-34.2	5/6/03	15:45	11.72	9.32	78	13.30	12.11	1.19	6.62	
32TOU-34.2	5/27/03	10:48	16.46	8.06	76	10.25	9.00	1.25	9.18	
32TOU-34.2	6/10/03	15:00	23.01	9.00	99	10.15	9.80	0.35	2.48	
32TOU-34.2	6/24/03	12:05	19.19	8.81	108	10.96	10.98	0.02	0.13	
32TOU-36.6	7/29/02	10:00	20.52	7.90	102	9.56				
32TOU-36.6	9/2/02	9:10	16.59	8.04	98	9.58				
32TOU-36.6	4/22/03	10:30	10.70	7.84	85	10.50				
32TOU-36.6	5/27/03	9:55	15.39	8.06	84	10.50				
32TOU-36.6	6/24/03	11:30	18.18	8.93	102	11.65				
32TOU-40.5	6/25/02	13:35	21.93	8.53	85	9.40	9.81	0.41	3.02	
32TOU-40.5	7/9/02	14:30	23.20	8.88	91	10.35				
32TOU-40.5	7/29/02	9:11	19.76	8.02	102	9.96	10.26	0.30	2.10	
32TOU-40.5	7/30/02	15:45	25.65	8.81	98	9.99	9.83	0.16	1.14	
32TOU-40.5	8/13/02	11:00	20.21	8.51	106	10.65				
32TOU-40.5	9/2/02	8:45	16.55	8.20	98	10.25	9.90	0.35	2.46	
32TOU-40.5	9/3/02	13:50	20.94	9.24	95	11.23	10.31	0.92	6.04	
32TOU-40.5	9/17/02	11:55	14.89	8.37	107	10.49				
32TOU-40.5	10/15/02	12:20	9.16	8.82	97	13.72	13.00	0.72	3.81	
32TOU-40.5	11/19/02	12:30	8.65	8.24	85	12.67	11.75	0.92	5.33	
32TOU-40.5	1/14/03	13:30	5.79	8.06	68	13.30	12.30	1.00	5.52	
32TOU-40.5	3/11/03	11:35	6.63	7.70	62	12.40				
32TOU-40.5	4/7/03	12:20	6.76	7.62	73	12.75				
32TOU-40.5	4/21/03	15:30	13.42	8.77	81	11.20				
32TOU-40.5	4/22/03	9:25	10.36	7.73	84	10.30	10.14	0.16	1.11	
32TOU-40.5	5/6/03	14:30	10.68	9.32	75	13.16				
32TOU-40.5	5/26/03	14:45	16.05	8.76	77	11.21	9.72	1.49	10.07	
32TOU-40.5	5/26/03	8:27	13.39	7.83	81	10.40	9.20	1.20	8.66	
32TOU-40.5	5/27/03	8:30	13.96	7.82	82	10.24	9.91	0.33	2.32	
32TOU-40.5	5/29/03	14:45	20.47	8.58	81	10.30	9.10	1.20	8.75	
32TOU-40.5	6/10/03	14:25	21.54	9.07	92	11.00				
32TOU-40.5	6/23/03	14:10	19.39	9.01	98	11.40				
32TOU-40.5	6/24/03	10:30	16.99	8.71	101	11.40				
32TOU-44.2	7/30/02	14:45	23.98	8.70	90	9.42	9.15	0.27	2.06	

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Station ID	Date	Time	Temp (°C)	pH	Cond (uS/cm)	Hydrolab DO (mg/L)	Winkler DO (mg/L)	HL and Winkler DO Difference	HL and Winkler DO RSD%	Comments
32TOU-44.2	9/3/02	13:15	19.23	9.06	87	11.10				
32TOU-44.2	4/21/03	14:30	13.04	9.12	76	11.80				
32TOU-44.2	5/6/03	14:15		9.12						
32TOU-44.2	5/26/03	13:45	14.60	8.92	72	11.30	10.72	0.58	3.72	
32TOU-44.2	6/23/03	13:30	17.93	8.90	90	10.95				
32TOU-46.2	6/25/02	13:00	20.37	8.11	77	9.29				
32TOU-46.2	7/9/02	13:45	21.70	8.32	83	9.99				
32TOU-46.2	7/30/02	14:20	23.89	8.76	86	9.78				
32TOU-46.2	8/13/02	10:20	18.21	8.21	90	9.98				
32TOU-46.2	9/3/02	12:40	18.96	9.04	85	11.10	10.43	0.67	4.40	
32TOU-46.2	9/17/02	11:15	14.43	8.05	97	10.02				
32TOU-46.2	10/15/02	11:45	8.11	8.34	87	12.85				
32TOU-46.2	11/19/02	11:55	8.53	8.28	75	12.66				
32TOU-46.2	1/14/03	13:10	5.60	7.90	62	12.88				
32TOU-46.2	3/11/03	11:10	6.38	7.63	62	12.19	11.30	0.89	5.36	
32TOU-46.2	4/7/03	11:50	6.30	7.83	65	12.90	11.80	1.10	6.30	
32TOU-46.2	4/21/03	13:40	12.50	8.97	70	11.65	11.19	0.46	2.85	
32TOU-46.2	5/6/03	14:00	10.12	9.23	67	13.35	12.27	1.08	5.96	
32TOU-46.2	5/26/03	13:25	14.12	8.86	68	11.00				
32TOU-46.2	6/10/03	13:40	19.74	8.77	80	9.85	9.80	0.05	0.36	
32TOU-46.2	6/23/03	12:45	17.04	8.80	83	11.29	10.62	0.67	4.32	
32TOU-48.4	7/30/02	13:55	22.77	8.58	86	9.60				
32TOU-48.4	9/3/02	12:20	18.24	8.93	83	10.62				
32TOU-48.4	4/21/03	13:20	11.90	9.07	67	12.09				
32TOU-48.4	5/26/03	13:00	13.52	8.91	67	11.30	11.10	0.20	1.26	
32TOU-48.4	6/23/03	12:25	16.27	8.85	81	10.76				
32TOU-51.2	6/25/02	12:05	18.25	7.90	74	9.88	9.42	0.46	3.37	
32TOU-51.2	7/9/02	13:00	19.79	8.21	83	9.92				
32TOU-51.2	7/30/02	13:35	21.95	8.41	86	10.08	9.80	0.28	1.99	
32TOU-51.2	8/13/02	10:05	16.45	8.03	88	10.29				
32TOU-51.2	9/3/02	12:00	16.82	8.63	85	11.08				
32TOU-51.2	9/17/02	10:35	13.83	7.85	98	9.78	9.70	0.08	0.58	
32TOU-51.2	10/15/02	11:25	7.89	8.35	87	13.15	12.45	0.70	3.87	
32TOU-51.2	11/19/02	11:20	8.20	8.21	73	12.67	11.80	0.87	5.03	
32TOU-51.2	1/14/03	12:30	5.52	8.05	59	13.03	12.21	0.82	4.59	
32TOU-51.2	3/11/03	10:55	6.18	7.70	60	12.40				
32TOU-51.2	4/7/03	11:30	6.05	7.98	62	13.16				
32TOU-51.2	4/21/03	11:10	10.02	8.90	68	12.50				
32TOU-51.2	5/6/03	13:10	9.33	9.08	66	13.60				
32TOU-51.2	5/26/03	12:25	12.98	8.84	67	12.00				
32TOU-51.2	6/10/03	13:05	18.39	8.43	78	9.80				
32TOU-51.2	6/23/03	11:00	14.45	8.68	81	11.65				
32TOU-53.9	7/30/02	12:45	20.58	7.88	75	9.45	9.15	0.30	2.28	

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Station ID	Date	Time	Temp (°C)	pH	Cond (uS/cm)	Hydrolab DO (mg/L)	Winkler DO (mg/L)	HL and Winkler DO Difference	HL and Winkler DO RSD%	Comments
32TOU-53.9	9/3/02	11:15	15.86	8.31	73	10.35				
32TOU-53.9	9/17/02	10:00	13.32	7.84	77	9.93				
32TOU-53.9	10/15/02	10:50	7.76	8.28	76	12.65				
32TOU-53.9	11/19/02	10:35	7.76	7.99	65	12.45				
32TOU-53.9	1/14/03	11:15	5.20	7.80	53	13.18				
32TOU-53.9	3/11/03	9:45	5.70	7.74	55	12.53				
32TOU-53.9	4/7/03	9:41	4.64	7.78	54	13.20				
32TOU-53.9	4/21/03	10:50	9.50	8.87	57	12.20	11.50	0.70	4.18	
32TOU-53.9	5/6/03	12:42	8.67	8.63	57	12.65				
32TOU-53.9	5/26/03	10:50	11.94	8.26	58	11.10				
32TOU-53.9	6/10/03	11:02	15.92	8.07	67	9.60				
32TOU-53.9	6/23/03	9:38	12.71	8.52	70	11.35				
32WAL-09.3	6/26/02	15:00	27.77	8.27	209	8.77	8.70	0.07	0.57	
32WAL-09.3	7/9/02	9:05	21.12	7.95	263	7.83	7.60	0.23	2.11	
32WAL-09.3	7/10/02	17:00	27.65	8.39	274	9.69	9.60	0.09	0.66	
32WAL-09.3	7/12/02	11:25	27.27	8.03	277	8.04	7.50	0.54	4.91	
32WAL-09.3	7/31/02	10:05	22.99	7.68	383	7.21	7.25	0.04	0.39	
32WAL-09.3	8/12/02	16:10	26.26	8.45	355	10.05	9.80	0.25	1.78	
32WAL-09.3	8/13/02	15:15	25.42	8.54	345	9.42	9.80	0.38	2.80	
32WAL-09.3	8/15/02	10:30	24.50	8.14	385	7.05	7.10	0.05	0.50	
32WAL-09.3	9/5/02	13:15	20.00	8.32	483	8.60				
32WAL-09.3	9/5/02	13:20	19.10	8.34	483	9.08				
32WAL-09.3	9/5/02	13:25					9.28			sampled near surface
32WAL-09.3	9/5/02	13:25					9.02			sampled near bottom
32WAL-09.3	9/18/02	15:20	18.97	8.71	347	11.68	11.45	0.23	1.41	
32WAL-09.3	10/17/02	13:10	9.87	8.52	316	12.20				
32WAL-09.3	11/21/02	13:15	8.96	8.30	234	11.77	11.60	0.17	1.03	
32WAL-09.3	1/16/03	14:40	6.00	7.84	118	12.22	11.70	0.52	3.07	
32WAL-09.3	3/13/03	11:30	9.46	7.74	71	10.93	10.55	0.38	2.50	
32WAL-09.3	4/9/03	12:00	12.31	7.79	86	10.35	9.90	0.45	3.14	
32WAL-09.3	4/24/03	14:40	13.04	7.99	127	9.71	10.10	0.39	2.78	
32WAL-09.3	5/8/03	12:20	12.83	8.25	117	11.75	11.02	0.73	4.53	
32WAL-09.3	5/29/03	17:25	23.66	8.05	164	8.80	8.42	0.38	3.12	
32WAL-09.3	6/9/03	20:50	24.07	8.52	289	9.30	9.12	0.18	1.38	
32WAL-09.3	6/10/03	17:33	23.40	8.57	282	10.25	10.42	0.17	1.16	
32WAL-09.3	6/12/03	13:52	23.45	8.82	293	11.55	12.19	0.64	3.81	
32WAL-09.3	6/22/03	16:45	19.68	8.48	359	10.10	10.28	0.18	1.25	
32WAL-09.3	6/23/03	16:42	21.61	8.52	336	10.35	15.20	4.85	26.85	
32WAL-09.3	6/25/03	19:48	25.26	8.31	302	9.15	9.30	0.15	1.15	
32WAL-09.3	6/26/03	16:50	26.50	8.41	312	10.05	10.01	0.04	0.28	
32WAL-09.3	6/27/03	12:15	24.64	8.12	310	8.15				
32WAL-12.0	7/31/02	10:30	23.28	7.93	356	7.63				

Table C-1. Field measurements for the Walla Walla TMDL. All except Winkler DO were taken using a Hydrolab® (HL).

Station ID	Date	Time	Temp (°C)	pH	Cond (uS/cm)	Hydrolab DO (mg/L)	Winkler DO (mg/L)	HL and Winkler DO Difference	HL and Winkler DO RSD%	Comments
32WAL-12.0	9/5/02	13:00	18.69	8.35	465	8.50				
32WAL-12.0	3/13/03	11:10	9.36	7.56	70	11.25				
32WAL-12.0	4/24/03	14:25	12.74	7.91	126	9.80	10.00	0.20	1.43	
32WAL-12.0	6/26/03	16:30	25.07	8.17	301	9.00				
32WAL-15.6	6/26/02	14:00	26.95	8.24	206	9.40				
32WAL-15.6	7/10/02	15:45	27.00	8.20	271	9.20	8.70	0.50	3.95	
32WAL-15.6	7/31/02	10:55	23.02	7.83	341	8.13	8.08	0.05	0.44	
32WAL-15.6	8/15/02	11:20	24.54	8.33	433	9.16				
32WAL-15.6	9/5/02	12:30	18.56	8.46	462	9.91	10.50	0.59	4.09	
32WAL-15.6	9/18/02	14:45	18.81	8.90	330	13.15				
32WAL-15.6	10/17/02	12:30	10.10	8.35	281	12.12	11.80	0.32	1.89	
32WAL-15.6	11/21/02	12:45	8.89	8.13	226	11.55	11.14	0.41	2.56	
32WAL-15.6	1/16/03	14:00	5.81	7.85	117	12.65	11.90	0.75	4.32	
32WAL-15.6	4/9/03	11:30	11.70	7.76	84	10.50	10.10	0.40	2.75	
32WAL-15.6	4/24/03	14:05	12.63	7.92	126	9.99	10.14	0.15	1.05	
32WAL-15.6	5/8/03	11:55	12.01	8.10	119	11.80	11.05	0.75	4.64	
32WAL-15.6	5/29/03	17:00	23.04	8.35	158	9.25	9.20	0.05	0.38	
32WAL-15.6	6/12/03	13:25	23.33	8.34	281	9.56	9.80	0.24	1.75	
32WAL-15.6	6/26/03	16:00	25.24	8.17	309	9.55				
32WAL-22.7	6/26/02	16:15	27.55	8.15	374	9.33				
32WAL-22.7	7/10/02	15:10	26.00	8.02	336	8.61				
32WAL-22.7	7/31/02	11:50	23.46	7.74	431	7.50				
32WAL-22.7	8/15/02	12:05	23.80	7.89	395	8.46				
32WAL-22.7	9/5/02	11:45	18.42	8.21	331	8.80				
32WAL-22.7	9/5/02	11:47	18.36	8.21	331	8.65				
32WAL-22.7	9/18/02	13:40	17.45	8.47	250	11.36	11.12	0.24	1.51	
32WAL-22.7	10/17/02	11:45	8.67	8.12	387	11.53				
32WAL-22.7	11/21/02	12:15	9.03	8.10	294	10.93				
32WAL-22.7	1/16/03	13:35	5.97	7.81	127	12.79				
32WAL-22.7	3/13/03	10:20	9.01	7.60	73	11.08	10.45	0.63	4.14	
32WAL-22.7	4/9/03	11:00	10.44	7.80	86	10.61	10.35	0.26	1.75	
32WAL-22.7	4/24/03	12:35	11.68	7.88	128	10.11				
32WAL-22.7	5/8/03	11:30	10.50	7.93	125		11.45			
32WAL-22.7	5/29/03	13:20	20.15	7.71	180	8.57				
32WAL-22.7	6/12/03	12:55	23.09	8.07	367	8.45	8.71	0.26	2.14	
32WAL-22.7	6/26/03	15:05	25.27	8.10	357	8.64				
32WAL-27.4	6/26/02	12:20	25.02	7.57	219	8.73	8.75	0.02	0.16	
32WAL-27.4	7/10/02	14:30	26.90	8.49	214	11.91	11.62	0.29	1.74	
32WAL-27.4	7/31/02	13:15	25.20	8.09	205	11.23	11.10	0.13	0.82	
32WAL-27.4	9/5/02	10:50	18.29	7.83	175	8.40				
32WAL-27.4	9/18/02	12:25	17.59	8.49	152	11.20				
32WAL-27.4	10/17/02	10:50	9.95	8.06	240	13.37				
32WAL-27.4	11/21/02	11:35	9.11	8.17	229	13.05	12.90	0.15	0.82	

Table C-1. Field measurements for the Walla Walla TMDL. All except Winkler DO were taken using a Hydrolab® (HL).

Station ID	Date	Time	Temp (°C)	pH	Cond (uS/cm)	Hydrolab DO (mg/L)	Winkler DO (mg/L)	HL and Winkler DO Difference	HL and Winkler DO RSD%	Comments
32WAL-27.4	1/16/03	12:50	6.10	7.80	100	13.00	12.05	0.95	5.36	
32WAL-27.4	3/13/03	10:00	8.70	7.76	63	11.43				
32WAL-27.4	4/9/03	10:35	9.75	7.75	73	11.50				
32WAL-27.4	4/24/03	12:00	11.33	8.41	101	11.35	11.88	0.53	3.23	
32WAL-27.4	5/8/03	10:15	9.93	8.34	99	13.60	13.05	0.55	2.92	
32WAL-27.4	5/29/03	12:05	20.14	8.46	130	11.04				
32WAL-27.4	6/10/03	8:40	19.34	7.59	232	7.90	8.27	0.37	3.24	
32WAL-27.4	6/11/03	8:55	18.96	7.63	222	8.50	8.71	0.21	1.73	
32WAL-27.4	6/12/03	12:25	22.82	8.06	237	10.55	11.30	0.75	4.85	
32WAL-27.4	6/26/03	13:55	24.17	8.22	233	11.20				
32WAL-29.3	6/26/02	11:45	24.17	8.20	188	10.35				
32WAL-29.3	7/10/02	13:45	26.39	8.76	191	12.05				
32WAL-29.3	7/31/02	13:50	25.46	8.68	153	11.61				
32WAL-29.3	8/15/02	12:55	25.19	8.58	168	10.00				
32WAL-29.3	9/5/02	9:55	16.83	7.75	149	8.69	8.01	0.68	5.76	
32WAL-29.3	9/18/02	11:10	16.36	8.60	138	11.85	11.68	0.17	1.02	
32WAL-29.3	10/17/02	10:20	9.38	8.20	198	13.34	13.02	0.32	1.72	
32WAL-29.3	11/21/02	11:00	9.11	8.22	212	12.80				
32WAL-29.3	1/16/03	12:30	5.97	7.74	97	13.10				
32WAL-29.3	3/13/03	9:45	8.58	7.57	64	11.64	10.60	1.04	6.61	
32WAL-29.3	4/9/03	10:20	9.58	7.66	76	11.35	11.00	0.35	2.21	
32WAL-29.3	4/24/03	11:25	11.03	7.95	105	11.41				
32WAL-29.3	5/8/03	10:05	9.73	8.28	101	13.05	12.31	0.74	4.13	
32WAL-29.3	5/29/03	11:20	19.01	8.24	128	11.04	10.73	0.31	2.01	
32WAL-29.3	6/12/03	11:30	22.57	9.02	187	13.40	14.60	1.20	6.06	
32WAL-29.3	6/22/03	17:30	20.87	9.21	166	13.30	13.00	0.30	1.61	
32WAL-29.3	6/23/03	18:20	22.26	9.40	166	12.65	12.50	0.15	0.84	
32WAL-29.3	6/25/03	20:20	23.19	8.82	186	8.15	7.80	0.35	3.10	
32WAL-29.3	6/26/03	13:16	25.24	9.49	186	17.60	16.80	0.80	3.29	
32WAL-29.3	6/27/03	11:34	23.95	9.26	189	15.35	15.20	0.15	0.69	
32WAL-32.8	6/26/02	11:00	21.65	8.20	176	10.00	9.82	0.18	1.28	
32WAL-32.8	7/10/02	12:55	23.06	8.46	173	11.27				
32WAL-32.8	7/31/02	14:15	22.86	8.36	130	10.60	10.45	0.15	1.01	
32WAL-32.8	10/17/02	9:55	8.63	8.05	177	12.92				
32WAL-32.8	11/21/02	10:25	9.22	7.98	201	11.80	11.59	0.21	1.27	
32WAL-32.8	1/16/03	10:20	5.63	7.54	95	13.20				
32WAL-32.8	3/13/03	9:35	8.42	7.65	61	11.70				
32WAL-32.8	4/9/03	10:10	9.26	7.77	71	11.90				
32WAL-32.8	4/24/03	11:05	10.69	7.83	154	10.95				
32WAL-32.8	5/8/03	9:50	8.92	8.08	98	13.05	12.20	0.85	4.76	
32WAL-32.8	5/29/03	10:40	17.25	8.07	113	10.54				
32WAL-32.8	6/12/03	10:55	20.03	8.78	168	12.76				
32WAL-32.8	6/26/03	12:35	22.20	8.88	170	12.00				

Table C-1. Field measurements for the Walla Walla TMDL. All except Winkler DO were taken using a Hydrolab® (HL).

Station ID	Date	Time	Temp (°C)	pH	Cond (uS/cm)	Hydrolab DO (mg/L)	Winkler DO (mg/L)	HL and Winkler DO Difference	HL and Winkler DO RSD%	Comments
32WAL-34.0	9/5/02	9:40	15.04	7.81	122	9.46				
32WAL-34.0	9/18/02	10:45	14.49	8.04	115	10.42				
32WAL-35.2	7/31/02	15:00	22.22	7.81	117	9.80				
32WAL-35.2	8/15/02	13:30	21.55	8.35	127	9.77				
32WAL-35.2	9/5/02	9:15	14.85	7.76	118	9.01				
32WAL-35.2	9/18/02	9:50	13.82	7.85	112	10.14				
32WAL-35.2	4/24/03	9:50	9.71	7.76	83	11.00				
32WAL-35.2	5/29/03	9:30	14.62	7.51	95	10.50				
32WAL-38.7	6/26/02	9:30	17.20	7.50	103	9.25	9.10	0.15	1.16	
32WAL-38.7	7/10/02	11:30	19.45	7.82	115	10.15	9.90	0.25	1.76	
32WAL-38.7	7/11/02	12:10	21.72	8.19	113	10.49	10.10	0.39	2.68	
32WAL-38.7	7/31/02	15:45	22.63	8.09	115	9.81	10.35	0.54	3.79	
32WAL-38.7	8/15/02	15:05	22.84	8.45	110	9.25				
32WAL-38.7	8/15/02	7:45	17.40	7.49	120	7.65				
32WAL-38.7	9/5/02	8:40	15.23	7.58	102	8.67	7.78	0.89	7.65	
32WAL-38.7	9/18/02	8:45	13.35	7.65	101	9.40	9.40	0.00	0.00	
32WAL-38.7	10/17/02	9:25	8.83	7.60	114	10.81	10.60	0.21	1.39	
32WAL-38.7	11/21/02	9:15	8.78	7.49	100	10.38	10.10	0.28	1.93	
32WAL-38.7	1/16/03	9:20	4.86	7.42	57	12.80	11.93	0.87	4.98	
32WAL-38.7	3/13/03	9:05	7.61	7.41	47	11.64	10.80	0.84	5.29	
32WAL-38.7	4/9/03	9:45	7.92	7.53	46	11.87	11.20	0.67	4.11	
32WAL-38.7	4/24/03	9:15	8.76	7.74	54	11.15	11.41	0.26	1.63	
32WAL-38.7	5/8/03	9:20	7.39	8.28	59	13.60	12.74	0.86	4.62	
32WAL-38.7	5/29/03	8:45	12.61	7.50	59	10.37	10.10	0.27	1.87	
32WAL-38.7	6/10/03	9:23	16.44	7.73	106	10.03	9.93	0.10	0.71	
32WAL-38.7	6/11/03	9:44	16.03	7.78	113	10.00	9.93	0.07	0.50	
32WAL-38.7	6/12/03	9:35	16.27	7.73	121	9.95	9.98	0.03	0.21	
32WAL-38.7	6/22/03	18:06	17.32	8.16	113	10.00	9.80	0.20	1.43	
32WAL-38.7	6/23/03	17:48	19.30	8.36	114	10.45	9.74	0.71	4.97	
32WAL-38.7	6/25/03	20:53	19.66	7.46	124	7.90	7.62	0.28	2.55	
32WAL-38.7	6/26/03	10:15	17.21	7.98	138	10.67	10.47	0.20	1.34	
32WAL-38.7	6/27/03	10:56	18.64	8.07	130	10.45				
32WAL-WWTP	9/10/02	15:25		6.84	305					
32WAL-WWTP	9/10/02	10:00		6.63	248					
32WAL-WWTP	12/2/02	14:50	13.21	7.17	261	8.88	7.90	0.98	8.26	
32WAL-WWTP	12/2/02	10:10	13.16	7.07	303	9.01				
32WAL-WWTP	12/3/02	10:00	13.34	6.90	285	8.65	7.85	0.80	6.86	
32WAL-WWTP	1/16/03	11:00	12.81	6.94	228	9.35	8.20	1.15	9.27	
32WAL-WWTP	2/25/03	15:55					8.15			
32WAL-WWTP	2/25/03	15:55					8.12			field replicate
32WAL-WWTP	3/12/03	11:50	13.88	6.86	280	9.03				
32WAL-WWTP	4/8/03	12:50	14.56	6.81	269	9.50				
32WLW-00.8	4/24/03	10:10	12.39	7.62	175	9.56	9.70	0.14	1.03	

Table C-1. Field measurements for the Walla Walla TMDL. All except Winkler DO were taken using a Hydrolab® (HL).

Station ID	Date	Time	Temp (°C)	pH	Cond (uS/cm)	Hydrolab DO (mg/L)	Winkler DO (mg/L)	HL and Winkler DO Difference	HL and Winkler DO RSD%	Comments
32WLW-00.8	5/29/03	9:45	18.34	7.75	179	10.74	10.30	0.44	2.96	
32WLW-00.8	6/26/03	11:42	21.26	8.43	283	12.70				
32YEL-00.2	6/26/02	10:00	18.87	7.78	119	9.00				
32YEL-00.2	7/11/02	16:05	23.80	8.00	141	8.22				
32YEL-00.2	8/1/02	13:50	18.38	7.83	127	9.26				
32YEL-00.2	8/14/02	14:40	21.20	8.08	142	8.73				
32YEL-00.2	9/4/02	13:25	16.09	8.20	111	9.75	9.61	0.14	1.02	
32YEL-00.2	9/19/02	13:20	15.19	7.97	106	9.86	9.66	0.20	1.45	
32YEL-00.2	10/16/02	13:50	9.30	8.09	127	11.72	11.30	0.42	2.58	
32YEL-00.2	11/20/02	14:00	9.28	7.83	109	11.00	11.00	0.00	0.00	
32YEL-00.2	1/15/03	12:15	6.02	7.91	109	13.35				
32YEL-00.2	3/12/03	13:55	9.81	7.76	84	11.40				
32YEL-00.2	4/8/03	13:25	11.32	7.70	94	11.50	10.60	0.90	5.76	
32YEL-00.2	4/23/03	14:00	11.87	8.17	109	10.85				
32YEL-00.2	5/7/03	13:45	9.84	8.06	111	12.08				
32YEL-00.2	5/28/03	14:55	17.76	7.98	130	10.12				
32YEL-00.2	6/11/03	13:40	17.36	7.91	119	9.40				
32YEL-00.2	6/25/03	14:45	18.48	8.00	118	9.90				
32YEL-03.5	9/4/02	12:15	15.73	8.09	85	10.00				

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Appendix D

Ecology Flow Monitoring

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Table D-1. Ecology's instantaneous flow data for the Walla Walla TMDL.

Station ID	Date	Time	Flow (cfs)	Comments
32COP-00.5	7/30/02	15:20	0.19	
32COP-00.5	9/3/02	13:25	0.21	
32COP-00.5	4/21/03	14:45	22.4	Used rating curve to calculate flow.
32COP-00.5	5/26/03	14:00	8.20	Used rating curve to calculate flow.
32COP-00.5	6/23/03	13:46	2.10	Used rating curve to calculate flow.
32COT-01.0	8/1/02	13:10	0.31	
32COT-01.0	4/23/03	13:00	16.7	
32COT-01.0	5/28/03	14:15	4.58	
32COT-01.0	6/25/03	14:10	0.84	
32DRY-00.5	7/31/02	12:55	0.14	
32DRY-00.5	9/5/02	10:25	0.58	
32GAR-00.5	6/27/02	14:55	1.06	
32GAR-00.5	8/1/02	11:25	0.22	
32GAR-00.5	9/4/02	13:50	0.43	
32GAR-00.5	9/19/02	13:50	0.39	
32GAR-00.5	11/20/02	14:40	1.68	
32GAR-00.5	1/15/03	13:40	4.05	
32GAR-00.5	3/12/03	13:15	6.63	
32GAR-00.5	4/8/03	14:15	7.42	
32GAR-00.5	4/23/03	14:40	7.94	
32GAR-00.5	5/7/03	15:00	5.87	
32GAR-00.5	5/28/03	15:30	2.96	
32GAR-00.5	6/11/03	14:40	0.73	
32GAR-00.5	6/25/03	15:10	1.18	
32MIL-00.5	6/27/02	16:15	8.17	
32MIL-00.5	7/11/02	9:50	4.48	
32MIL-00.5	8/1/02	10:15	0.13	
32MIL-00.5	9/4/02	15:40	0.26	
32MIL-00.5	9/19/02	15:50	0.32	
32MIL-00.5	10/16/02	15:40	2.01	
32MIL-00.5	11/20/02	15:15	14.5	
32MIL-00.5	1/15/03	14:15	69.9	
32MIL-00.5	4/8/03	15:55	249	
32MIL-00.5	4/23/03	17:00	113	
32MIL-00.5	5/7/03	16:10	175	
32MIL-00.5	5/8/03	10:30	157	Used rating curve to calculate flow.
32MIL-00.5	5/28/03	17:30	49.9	
32MIL-00.5	6/11/03	16:20	3.41	
32MIL-00.5	6/25/03	17:05	1.39	
32MIL-02.8	6/27/02	15:30	8.50	
32MIL-02.8	7/11/02	10:55	5.22	
32MIL-02.8	8/1/02	10:55	3.80	
32MIL-02.8	8/14/02	15:25	3.54	
32MIL-02.8	9/4/02	15:10	4.10	
32MIL-02.8	9/19/02	15:00	3.81	
32MIL-02.8	10/16/02	15:10	5.66	
32MIL-02.8	11/20/02	15:45	13.2	
32MIL-02.8	1/15/03	15:00	74.6	
32MIL-02.8	4/23/03	16:15	102	
32MIL-02.8	5/28/03	16:50	60.0	

Table D-1. Ecology's instantaneous flow data for the Walla Walla TMDL.

Station ID	Date	Time	Flow (cfs)	Comments
32MIL-02.8	6/11/03	15:45	6.34	
32MIL-02.8	6/25/03	16:30	4.76	
32MIL-04.8	6/27/02	13:10	3.32	
32MIL-04.8	8/1/02	15:35	0.15	
32MIL-04.8	8/14/02	14:15	0.17	
32MIL-04.8	9/4/02	14:20	0.15	
32MIL-04.8	9/19/02	14:30	0.36	
32MIL-04.8	10/16/02	12:40	0.43	
32MIL-04.8	11/20/02	13:20	5.13	
32MIL-04.8	6/11/03	15:10	1.26	
32MIL-04.8	6/25/03	15:42	0.28	
32MIL-06.7	9/19/02	12:40	2.75	
32MIL-06.7	10/16/02	11:40	2.22	
32MIL-06.7	11/20/02	12:00	6.46	
32MIL-06.7	1/15/03	10:45	57.5	
32MIL-06.7	6/11/03	12:55	2.91	
32MIL-06.7	6/25/03	12:20	2.84	
32MIL-11.5	4/8/03	11:00	259	Flow was taken at Yellowhawk/Garrison diversion.
32MIL-11.5	6/25/03	10:50	32.8	Flow was taken at Yellowhawk/Garrison diversion. Flow after diversion in Mill Creek was 0 cfs.
32MIL-12.8	6/27/02	10:30	40.9	
32MIL-12.8	7/12/02	7:43	27.0	
32MIL-12.8	8/1/02	18:15	20.1	
32MIL-12.8	9/4/02	10:00	23.8	
32MIL-12.8	9/19/02	11:10	24.7	
32MIL-12.8	4/23/03	10:20	202	
32MIL-12.8	5/28/03	11:10	93.4	
32MIL-12.8	6/11/03	11:15	41.1	
32MIL-12.8	6/25/03	10:15	38.8	
32MIL-21.1	7/12/02	11:35	28.0	
32MIL-21.1	8/1/02	19:10	28.7	
32MIL-21.1	8/14/02	11:10	25.1	
32MIL-21.1	9/19/02	10:15	31.7	
32MIL-21.1	10/16/02	9:20	31.6	
32MIL-21.1	11/20/02	10:15	38.9	
32MIL-21.1	1/15/03	9:15	80.4	
32MIL-21.1	4/23/03	8:55	119	
32MIL-21.1	5/28/03	10:30	78.5	
32MIL-21.1	6/11/03	10:50	45.1	
32MIL-21.1	6/25/03	9:32	37.7	
32MUD-00.5	7/31/02	12:20	3.57	
32MUD-00.5	9/5/02	11:20	1.54	
32MUD-00.5	9/18/02	12:50	2.43	
32MUD-00.5	4/24/03	13:35	3.41	
32MUD-00.5	5/29/03	12:20	2.29	
32NFT-00.0	6/25/02	10:30	55.3	
32NFT-00.0	7/9/02	11:25	61.2	
32NFT-00.0	7/30/02	11:45	43.0	
32NFT-00.0	8/13/02	8:56	42.9	
32NFT-00.0	9/3/02	9:45	37.3	

Table D-1. Ecology's instantaneous flow data for the Walla Walla TMDL.

Station ID	Date	Time	Flow (cfs)		Comments
32NFT-00.0	9/17/02	9:10	39.9		
32NFT-00.0	10/15/02	10:00	44.9		
32NFT-00.0	11/19/02	9:30	51.3		
32NFT-00.0	1/14/03	10:10	85.2		
32NFT-00.0	3/11/03	9:20	522		Used rating curve to calculate flow.
32NFT-00.0	4/7/03	9:22	214		Used rating curve to calculate flow.
32NFT-00.0	4/21/03	9:50	163		
32NFT-00.0	5/6/03	11:55	137		Used rating curve to calculate flow.
32NFT-00.0	5/26/03	10:25	109		Used rating curve to calculate flow.
32NFT-00.0	6/10/03	10:45	67.6		Used rating curve to calculate flow.
32NFT-00.0	6/23/03	10:30	56.3		Used rating curve to calculate flow.
32NFT-08.9	5/26/03	9:20	73.7		Used rating curve to calculate flow.
32NFT-08.9	5/27/03	19:14	68.1		Used rating curve to calculate flow.
32PAT-00.1	7/30/02	13:05	0.10		
32PAT-00.1	4/21/03	12:55	20.7		
32PAT-00.1	5/26/03	11:10	5.80		
32PAT-00.1	6/23/03	12:00	0.65		
32PIN-01.4	7/31/02	12:10	0.04		
32PIN-01.4	4/24/03	12:55	11.7		
32PIN-01.4	5/29/03	13:00	3.56		
32PIN-01.4	6/26/03	14:25	0.31		
32RUS-00.1	8/1/02	12:45	0.53		
32RUS-00.1	9/4/02	12:45	1.00		
32RUS-00.1	4/23/03	13:20	8.44		
32RUS-00.1	5/28/03	13:50	2.95		
32RUS-00.1	6/25/03	13:50	0.49		
32SFT-00.0	6/25/02	10:43	20.5		
32SFT-00.0	7/9/02	12:00	8.82		
32SFT-00.0	7/30/02	11:55	3.92		
32SFT-00.0	8/13/02	9:10	2.24		
32SFT-00.0	9/3/02	9:50	1.49		
32SFT-00.0	9/17/02	9:30	1.39		
32SFT-00.0	10/15/02	10:30	2.64		
32SFT-00.0	11/19/02	10:00	5.50		
32SFT-00.0	1/14/03	10:30	28.1		
32SFT-00.0	4/21/03	10:25	47.8		
32SFT-00.0	5/6/03	12:05	69.7		
32SFT-00.0	5/26/03	10:10	44.3		
32SFT-00.0	6/10/03	10:30	14.4		
32SFT-00.0	6/23/03	10:15	8.32		
32TOU-00.5	7/9/02	17:50	50.0	E	Estimated from gage 1.5 mi. upstream.
32TOU-00.5	7/29/02	16:45	15.8	E	Estimated from gage 1.5 mi. upstream.
32TOU-00.5	8/13/02	14:50	6.50	E	Estimated from gage 1.5 mi. upstream.
32TOU-00.5	9/2/02	13:10	6.10	E	Estimated from gage 1.5 mi. upstream.
32TOU-00.5	9/17/02	17:15	7.80	E	Estimated from gage 1.5 mi. upstream.
32TOU-00.5	10/15/02	15:15	21.5	E	Estimated from gage 1.5 mi. upstream.
32TOU-00.5	11/19/02	15:35	86.8	E	Estimated from gage 1.5 mi. upstream.
32TOU-00.5	1/14/03	16:15	138		
32TOU-00.5	3/11/03	13:30	1470	E	Estimated from gage 1.5 mi. upstream.
32TOU-00.5	4/7/03	15:20	511	E	Estimated from gage 1.5 mi. upstream.

Table D-1. Ecology's instantaneous flow data for the Walla Walla TMDL.

Station ID	Date	Time	Flow (cfs)		Comments
32TOU-00.5	4/22/03	15:10	239	E	Estimated from gage 1.5 mi. upstream.
32TOU-00.5	5/6/03	17:25	273	E	Estimated from gage 1.5 mi. upstream.
32TOU-00.5	5/27/03	14:58	160	E	Estimated from gage 1.5 mi. upstream.
32TOU-00.5	6/10/03	17:05	42.6	E	Estimated from gage 1.5 mi. upstream.
32TOU-00.5	6/24/03	16:30	30.0	E	Estimated from gage 1.5 mi. upstream.
32TOU-02.0	7/9/02	16:40	49.7		Used rating curve to calculate flow.
32TOU-02.0	7/11/02	8:40	44.1		Used rating curve to calculate flow.
32TOU-02.0	7/29/02	16:00	15.7		Used rating curve to calculate flow.
32TOU-02.0	8/13/02	14:00	6.30		Used rating curve to calculate flow.
32TOU-02.0	9/2/02	12:45	5.90		Used rating curve to calculate flow.
32TOU-02.0	9/17/02	16:05	8.00		Used rating curve to calculate flow.
32TOU-02.0	10/15/02	14:55	21.5		Used rating curve to calculate flow.
32TOU-02.0	11/19/02	15:15	86.9		Used rating curve to calculate flow.
32TOU-02.0	1/14/03	16:00	138		Used rating curve to calculate flow.
32TOU-02.0	4/22/03	14:40	239		Used rating curve to calculate flow.
32TOU-02.0	5/27/03	21:15	160		Used rating curve to calculate flow.
32TOU-02.0	5/27/03	14:25	161		Used rating curve to calculate flow.
32TOU-02.0	5/29/03	16:17	135		Used rating curve to calculate flow.
32TOU-02.0	6/24/03	16:05	30.1		Used rating curve to calculate flow.
32TOU-07.0	7/8/02	8:59	62.5		
32TOU-07.0	7/29/02	15:05	32.7		
32TOU-17.8	6/25/02	15:40	96.4		Used rating curve to calculate flow.
32TOU-17.8	7/9/02	16:00	61.1		
32TOU-17.8	7/9/02	20:36	61.9		Used rating curve to calculate flow.
32TOU-17.8	7/29/02	13:35	31.8		Used rating curve to calculate flow.
32TOU-17.8	8/13/02	12:00	24.5		Used rating curve to calculate flow.
32TOU-17.8	9/2/02	11:15	24.5		Used rating curve to calculate flow.
32TOU-17.8	9/17/02	14:50	30.0		Used rating curve to calculate flow.
32TOU-17.8	10/15/02	13:40	52.2		Used rating curve to calculate flow.
32TOU-17.8	11/19/02	14:05	63.3		Used rating curve to calculate flow.
32TOU-17.8	4/22/03	13:30	253		
32TOU-17.8	5/27/03	12:35	181		
32TOU-17.8	6/10/03	16:10	69.5		
32TOU-17.8	6/24/03	14:00	48.5		
32TOU-25.0	7/29/02	12:50	35.5		
32TOU-25.0	9/17/02	13:50	31.3		
32TOU-30.6	7/29/02	11:15	33.4		
32TOU-30.6	9/17/02	13:10	37.4		
32TOU-30.6	6/24/03	12:42	59.1		
32TOU-34.2	6/25/02	14:30	97.8		
32TOU-34.2	7/9/02	15:13	62.8		
32TOU-34.2	7/29/02	12:00	35.8		
32TOU-34.2	9/2/02	9:25	34.2		
32TOU-34.2	9/17/02	12:20	40.8		
32TOU-34.2	11/19/02	13:05	58.1		
32TOU-34.2	1/14/03	14:05	140		
32TOU-34.2	4/22/03	10:45	273		
32TOU-34.2	5/6/03	15:45	315		
32TOU-34.2	5/27/03	10:48	201		
32TOU-34.2	6/10/03	15:00	79.2		

Table D-1. Ecology's instantaneous flow data for the Walla Walla TMDL.

Station ID	Date	Time	Flow (cfs)		Comments
32TOU-36.6	7/29/02	10:00	39.0		
32TOU-36.6	5/27/03	9:55	202		
32TOU-36.6	6/24/03	11:30	56.6		
32TOU-40.5	6/25/02	13:35	111		
32TOU-40.5	7/9/02	14:30	73.1		
32TOU-40.5	7/29/02	9:11	42.8		
32TOU-40.5	7/30/02	15:45	40.9		Used rating curve to calculate flow.
32TOU-40.5	8/13/02	11:00	33.0		Used rating curve to calculate flow.
32TOU-40.5	9/2/02	8:45	34.4		Used rating curve to calculate flow.
32TOU-40.5	10/15/02	12:20	50.3		Used rating curve to calculate flow.
32TOU-40.5	11/19/02	12:30	57.8		Used rating curve to calculate flow.
32TOU-40.5	4/21/03	15:30	254		
32TOU-40.5	4/22/03	9:25	262		
32TOU-40.5	5/6/03	14:30	304		
32TOU-40.5	5/26/03	14:45	200		
32TOU-40.5	5/27/03	8:30	193		
32TOU-40.5	6/10/03	14:25	83.6		
32TOU-40.5	6/23/03	14:10	66.8		
32TOU-40.5	6/24/03	10:30	60.9		
32TOU-44.2	7/30/02	14:45	41.5		
32TOU-44.2	4/21/03	14:30	244		
32TOU-44.2	6/23/03	13:30	66.7		
32TOU-46.2	6/25/02	13:00	98.7		
32TOU-46.2	7/9/02	13:45	81.0		
32TOU-46.2	7/30/02	14:20	39.8		
32TOU-46.2	9/3/02	12:40	37.5		
32TOU-46.2	9/17/02	11:15	37.1		Used rating curve to calculate flow.
32TOU-46.2	11/19/02	11:55	31.1		Used rating curve to calculate flow.
32TOU-46.2	1/14/03	13:10	97.4		Used rating curve to calculate flow.
32TOU-46.2	3/11/03	11:10	753	E	High flow estimate. Used rating curve to calculate flow.
32TOU-46.2	4/7/03	11:50	438		Used rating curve to calculate flow.
32TOU-46.2	4/21/03	13:40	300		Used rating curve to calculate flow.
32TOU-46.2	5/6/03	14:00	336		Used rating curve to calculate flow.
32TOU-46.2	5/26/03	13:25	221		Used rating curve to calculate flow.
32TOU-46.2	6/10/03	13:40	86.8		
32TOU-46.2	6/23/03	12:45	62.2		Used rating curve to calculate flow.
32TOU-48.4	7/30/02	13:55	44.3		
32TOU-51.2	6/25/02	12:05	114		
32TOU-51.2	7/9/02	13:00	70.9		
32TOU-51.2	7/30/02	13:35	34.0		
32TOU-51.2	9/17/02	10:35	40.8		
32TOU-51.2	11/19/02	11:20	59.7		
32TOU-51.2	1/14/03	12:30	116		
32TOU-51.2	4/21/03	11:10	229		
32TOU-51.2	5/6/03	13:10	263		
32TOU-51.2	5/26/03	12:25	191		
32TOU-51.2	6/10/03	13:05	82.0		
32TOU-51.2	6/23/03	11:00	63.1		
32TOU-53.9	7/9/02	12:45	69.6		
32TOU-53.9	7/30/02	12:45	46.8		

Table D-1. Ecology's instantaneous flow data for the Walla Walla TMDL.

Station ID	Date	Time	Flow (cfs)	Comments
32TOU-53.9	9/3/02	11:15	28.6	Used rating curve to calculate flow.
32TOU-53.9	9/17/02	10:00	41.0	Used rating curve to calculate flow.
32TOU-53.9	10/15/02	10:50	47.0	Used rating curve to calculate flow.
32TOU-53.9	11/19/02	10:35	53.0	Used rating curve to calculate flow.
32TOU-53.9	4/7/03	9:41	302	
32WAL-09.3	6/26/02	15:00	99.0	
32WAL-09.3	7/31/02	10:05	21.7	
32WAL-09.3	8/15/02	10:30	9.15	
32WAL-09.3	11/21/02	13:15	90.0	
32WAL-15.6	6/26/02	14:00	102	
32WAL-15.6	7/10/02	15:45	58.5	
32WAL-15.6	7/31/02	10:55	27.0	
32WAL-15.6	9/18/02	14:45	29.5	
32WAL-15.6	10/17/02	12:30	21.9	
32WAL-22.7	7/10/02	15:10	6.95	
32WAL-22.7	7/31/02	11:50	5.02	
32WAL-22.7	9/18/02	13:40	33.1	
32WAL-27.4	6/26/02	12:20	8.96	
32WAL-27.4	7/31/02	13:15	4.38	
32WAL-27.4	9/5/02	10:50	10.9	
32WAL-27.4	9/18/02	12:25	30.4	
32WAL-27.4	10/17/02	10:50	8.65	
32WAL-27.4	11/21/02	11:35	31.6	
32WAL-29.3	6/26/02	11:45	15.3	
32WAL-29.3	7/10/02	13:45	11.0	
32WAL-29.3	7/31/02	13:50	17.9	
32WAL-29.3	8/15/02	12:55	6.30	
32WAL-29.3	9/5/02	9:55	16.7	
32WAL-29.3	10/17/02	10:20	16.0	
32WAL-29.3	11/21/02	11:00	33.5	
32WAL-29.3	1/16/03	12:30	293	
32WAL-29.3	5/29/03	11:20	150	
32WAL-29.3	6/12/03	11:30	15.1	
32WAL-29.3	6/26/03	13:16	14.6	
32WAL-32.8	6/26/02	11:00	34.9	
32WAL-32.8	7/10/02	12:55	32.7	
32WAL-32.8	7/31/02	14:15	41.4	
32WAL-32.8	11/21/02	10:25	41.8	
32WAL-32.8	1/16/03	10:20	268	
32WAL-32.8	4/24/03	11:05	367	
32WAL-32.8	5/29/03	10:40	171	
32WAL-32.8	6/12/03	10:55	41.0	
32WAL-32.8	6/26/03	12:35	32.9	
32WAL-34.0	9/18/02	10:45	38.9	
32WAL-35.2	7/31/02	15:00	33.3	
32WAL-35.2	8/15/02	13:30	29.6	
32WAL-35.2	9/5/02	9:15	40.3	
32WAL-35.2	9/18/02	9:50	63.3	
32WAL-38.7	6/26/02	9:30	20.5	
32WAL-38.7	7/10/02	19:30	10.9	

Table D-1. Ecology's instantaneous flow data for the Walla Walla TMDL.

Station ID	Date	Time	Flow (cfs)		Comments
32WAL-38.7	7/11/02	12:10	12.2	E	Estimated from gage 0.9 mi. upstream.
32WAL-38.7	7/31/02	15:45	12.2		
32WAL-38.7	8/15/02	7:45	9.60	E	Estimated from gage 0.9 mi. upstream.
32WAL-38.7	8/15/02	15:05	12.5		
32WAL-38.7	9/5/02	8:40	12.7		
32WAL-38.7	9/18/02	8:45	26.3		
32WAL-38.7	10/17/02	9:25	19.5		
32WAL-38.7	11/21/02	9:15	23.6		
32WAL-38.7	1/16/03	9:20	144		
32WAL-38.7	3/13/03	9:05	505	E	Estimated from gage 0.9 mi. upstream.
32WAL-38.7	4/9/03	9:45	258	E	Estimated from gage 0.9 mi. upstream.
32WAL-38.7	4/24/03	9:15	244		
32WAL-38.7	5/8/03	9:20	168	E	Estimated from gage 0.9 mi. upstream.
32WAL-38.7	5/29/03	8:45	142		
32WAL-38.7	6/10/03	9:23	19.2	E	Estimated from gage 0.9 mi. upstream.
32WAL-38.7	6/11/03	9:44	15.9	E	Estimated from gage 0.9 mi. upstream.
32WAL-38.7	6/12/03	9:35	13.2		
32WAL-38.7	6/22/03	18:06	14.2	E	Estimated from gage 0.9 mi. upstream.
32WAL-38.7	6/23/03	17:48	13.4	E	Estimated from gage 0.9 mi. upstream.
32WAL-38.7	6/25/03	20:53	10.5	E	Estimated from gage 0.9 mi. upstream.
32WAL-38.7	6/26/03	10:15	10.8	E	Estimated from gage 0.9 mi. upstream.
32WAL-38.7	6/27/03	10:56	10.5		
32WLW-00.8	4/24/03	10:10	5.95		
32WLW-00.8	5/29/03	9:45	3.44		
32WLW-00.8	6/26/03	11:42	0.35		
32YEL-00.2	6/26/02	10:00	27.1		
32YEL-00.2	7/8/02	12:10	22.7		
32YEL-00.2	7/11/02	16:05	29.1		Used rating curve to calculate flow.
32YEL-00.2	8/1/02	13:50	14.3		
32YEL-00.2	8/14/02	14:40	15.6		Used rating curve to calculate flow.
32YEL-00.2	9/4/02	13:25	14.5		
32YEL-00.2	9/19/02	13:20	20.0		
32YEL-00.2	10/16/02	13:50	15.0		
32YEL-00.2	11/20/02	14:00	32.3		
32YEL-00.2	1/15/03	12:15	33.1		
32YEL-00.2	4/8/03	13:25	111		
32YEL-00.2	4/23/03	14:00	62.6		
32YEL-00.2	5/7/03	13:45	71.1		
32YEL-00.2	5/28/03	14:55	44.9		
32YEL-03.5	9/4/02	12:15	16.4		

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Appendix E

Datalogger Results

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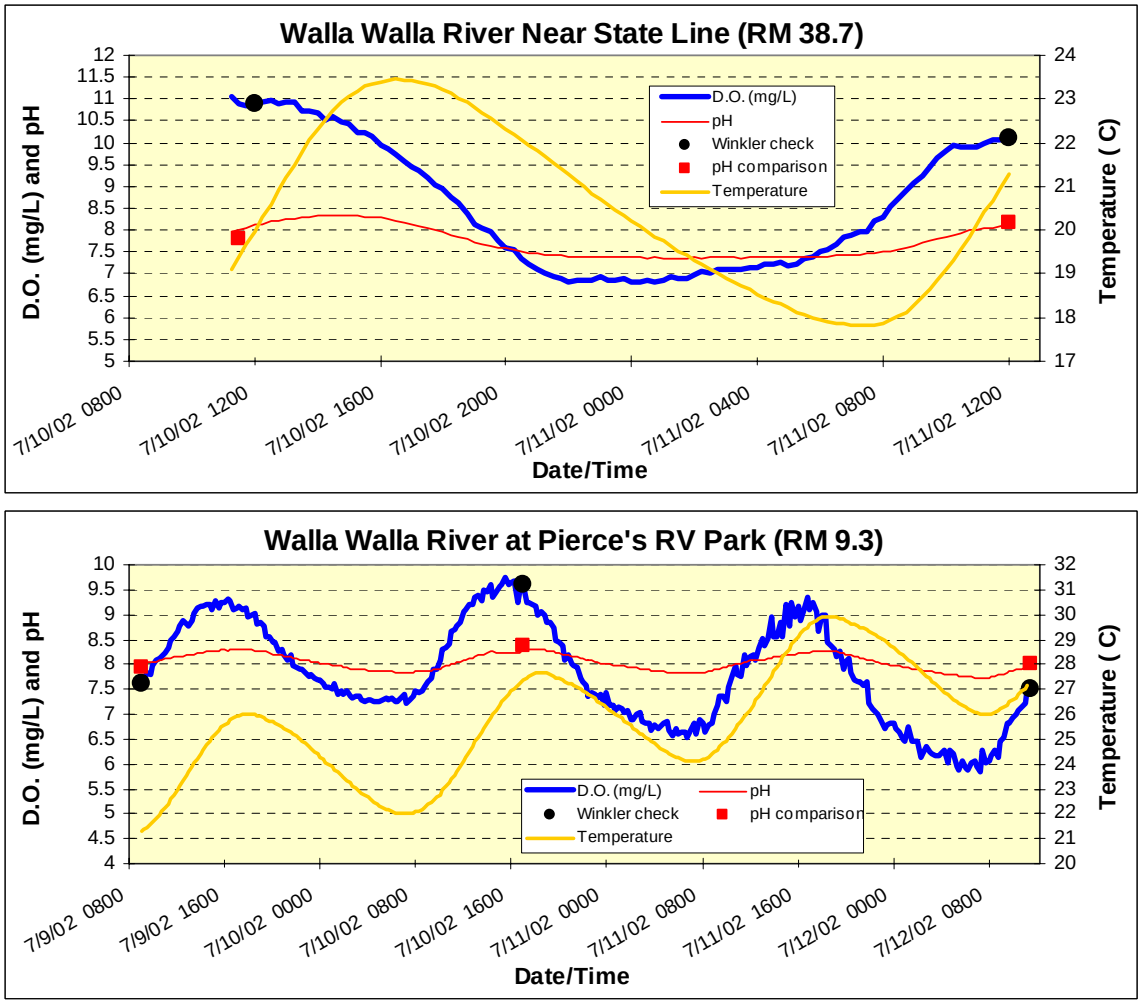
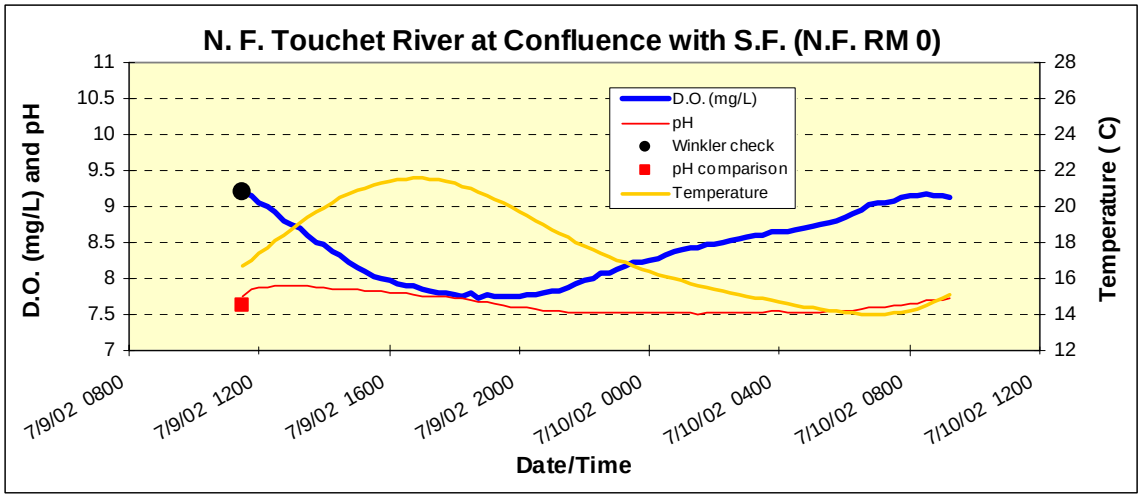
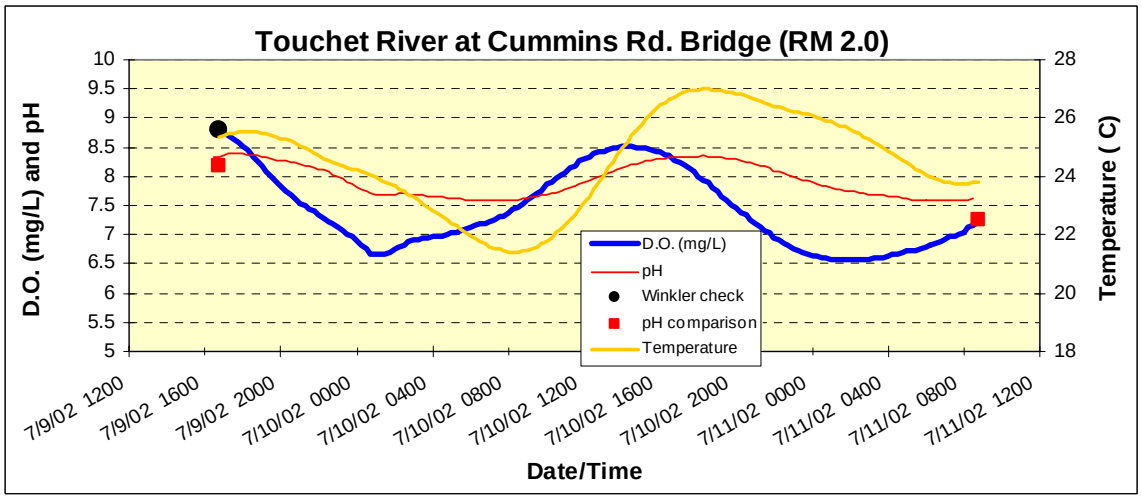
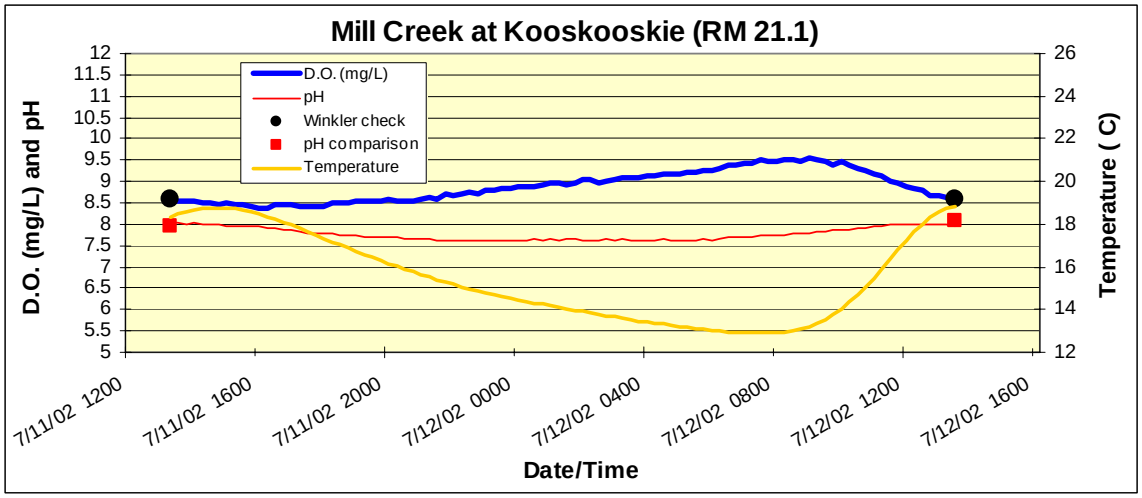


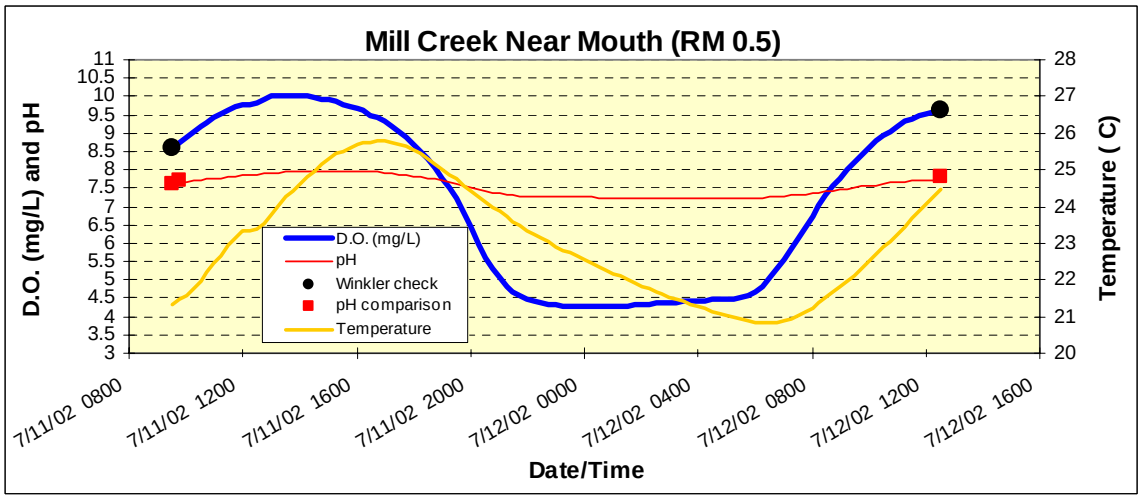
DataSonde® pH, dissolved oxygen (DO), and temperature taken every 15 minutes – July 9-12, 2002. Dissolved oxygen measurements were corrected to match Winkler checks. pH comparisons were taken with another calibrated DataSonde®.



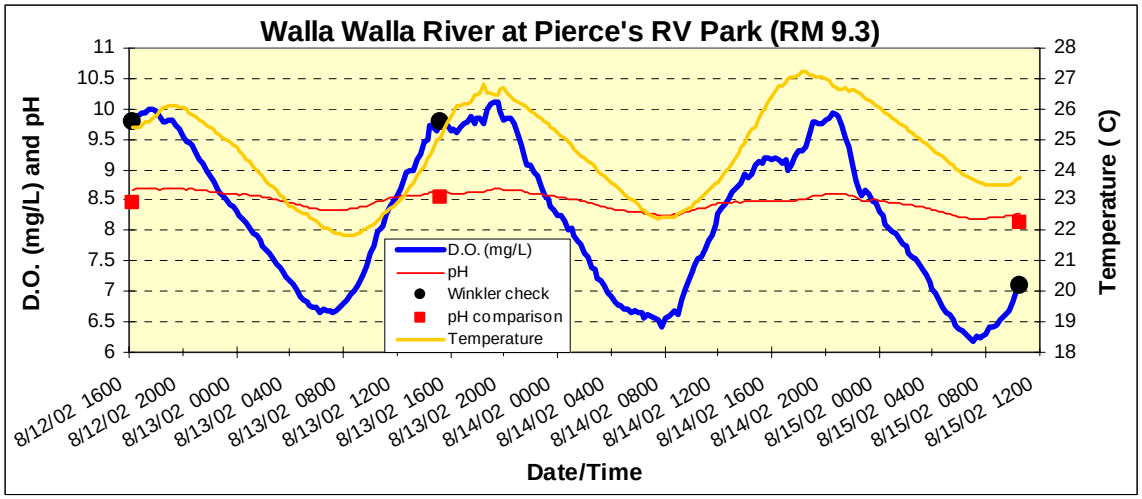


DataSonde® pH, dissolved oxygen (DO), and temperature taken every 15 minutes – July 9-12, 2002. Dissolved oxygen measurements were corrected to match Winkler checks. pH comparisons were taken with another calibrated DataSonde®.

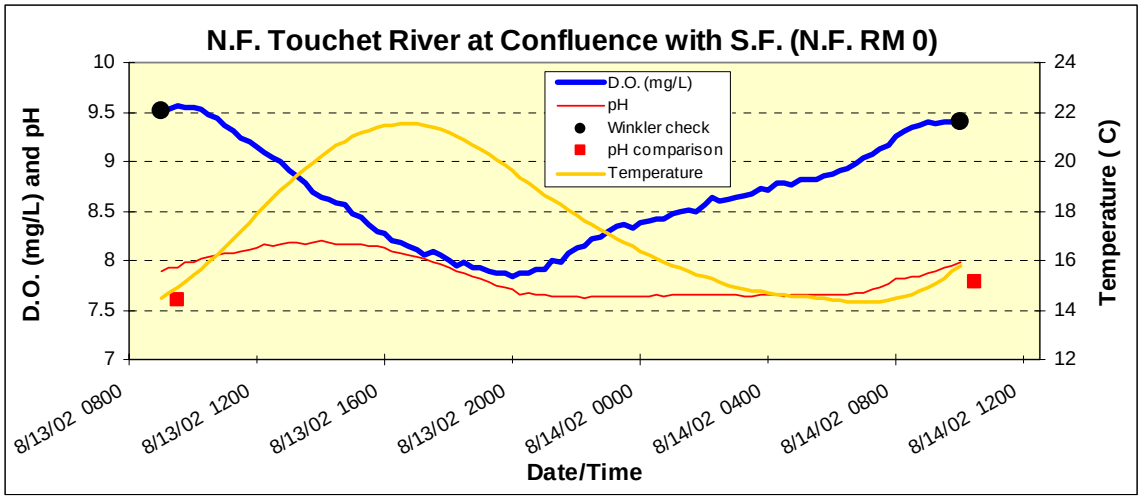


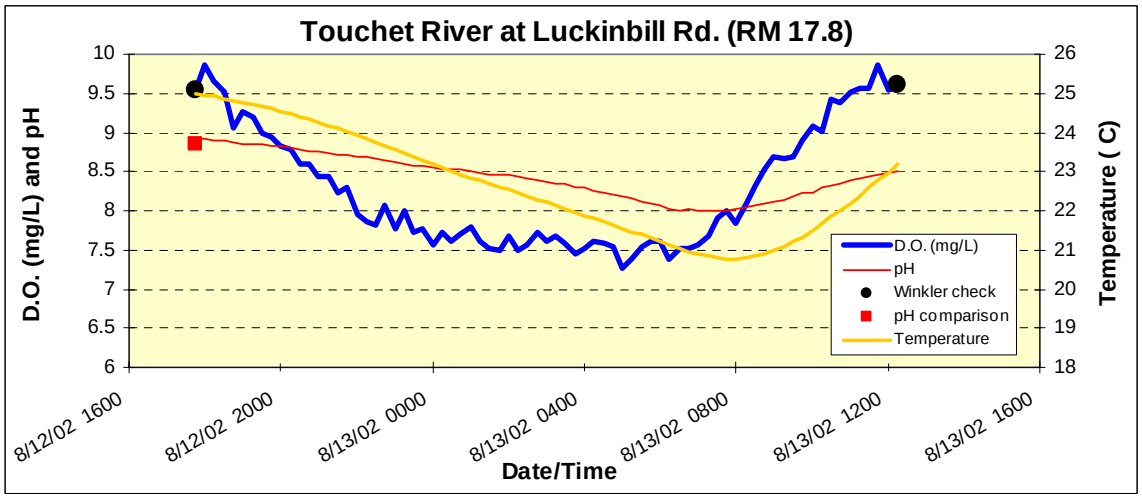


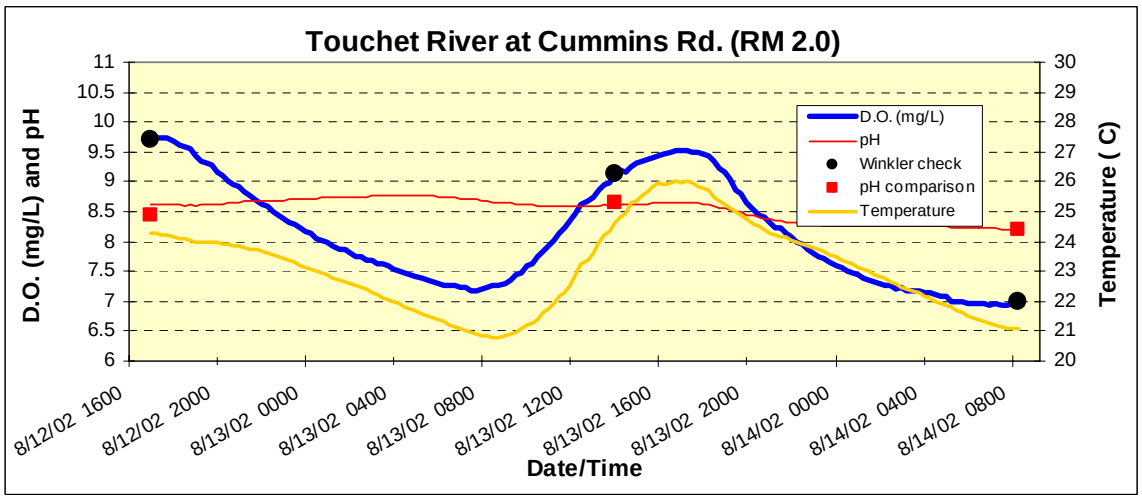
DataSonde® pH, dissolved oxygen (DO), and temperature taken every 15 minutes – July 9-12, 2002. Dissolved oxygen measurements were corrected to match Winkler checks. pH comparisons were taken with another calibrated DataSonde®.



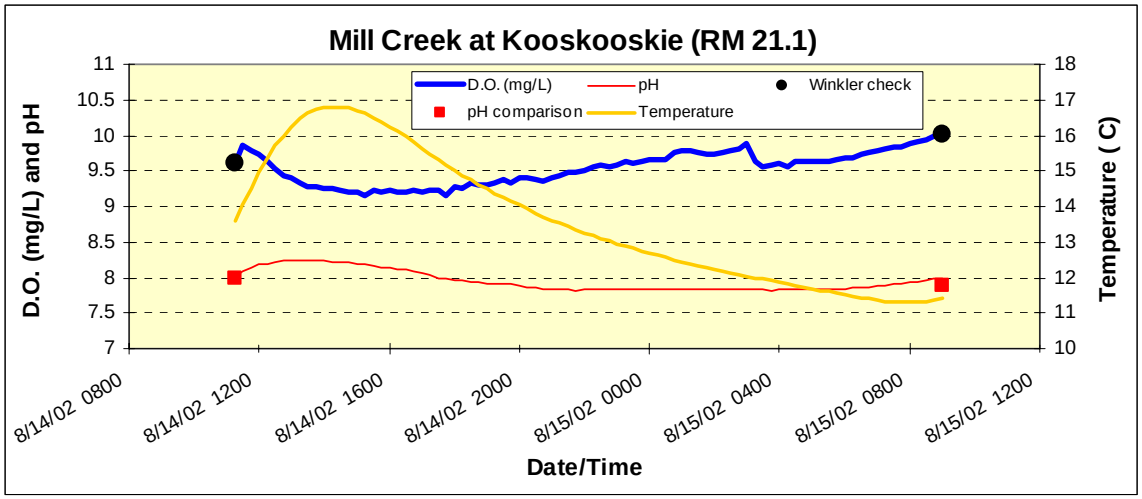
DataSonde® pH, dissolved oxygen (DO), and temperature taken every 15 minutes – August 12-15, 2002. Dissolved oxygen measurements were corrected to match Winkler checks. pH comparisons were taken with another calibrated DataSonde®.

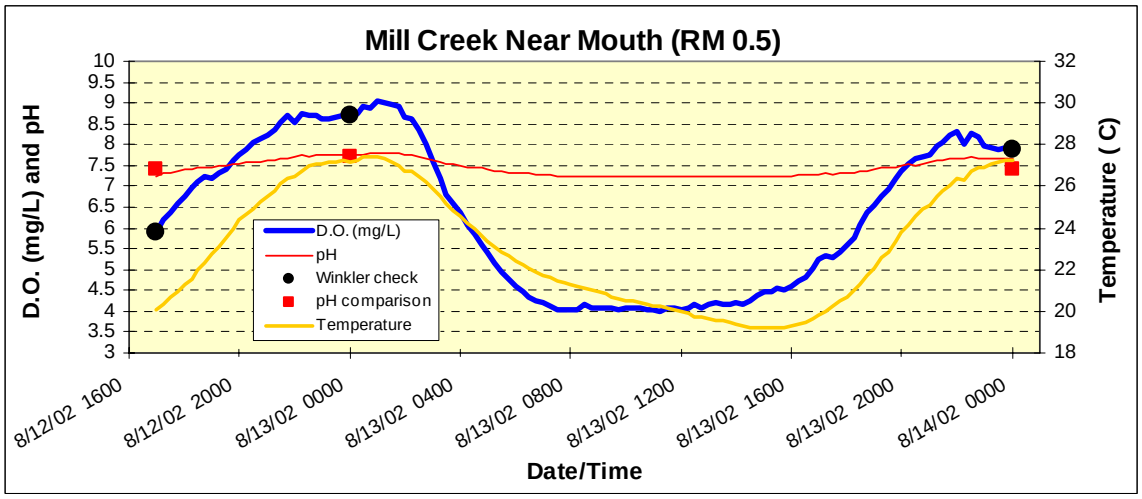




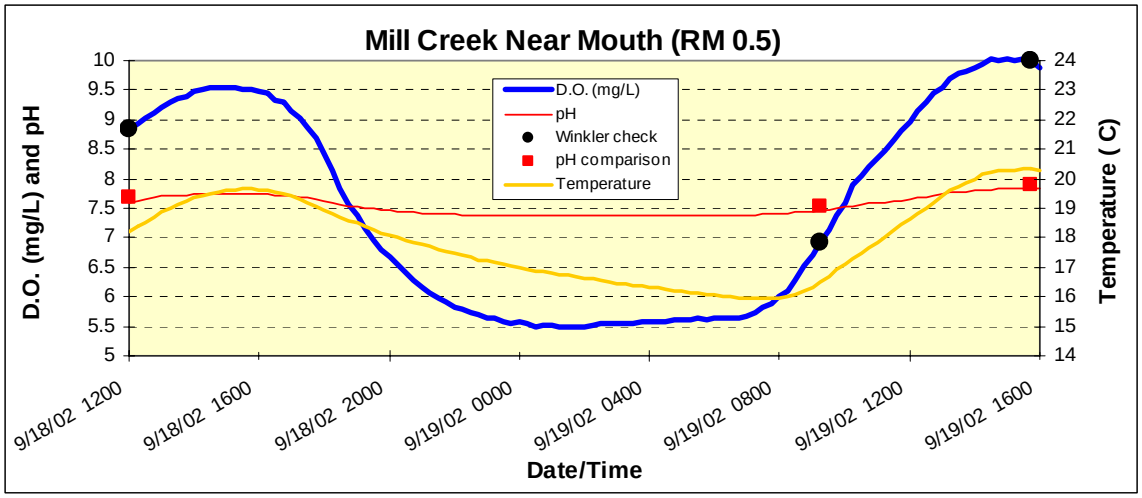


DataSonde® pH, dissolved oxygen (DO), and temperature taken every 15 minutes – August 12-15, 2002. Dissolved oxygen measurements were corrected to match Winkler checks. pH comparisons were taken with another calibrated DataSonde®.

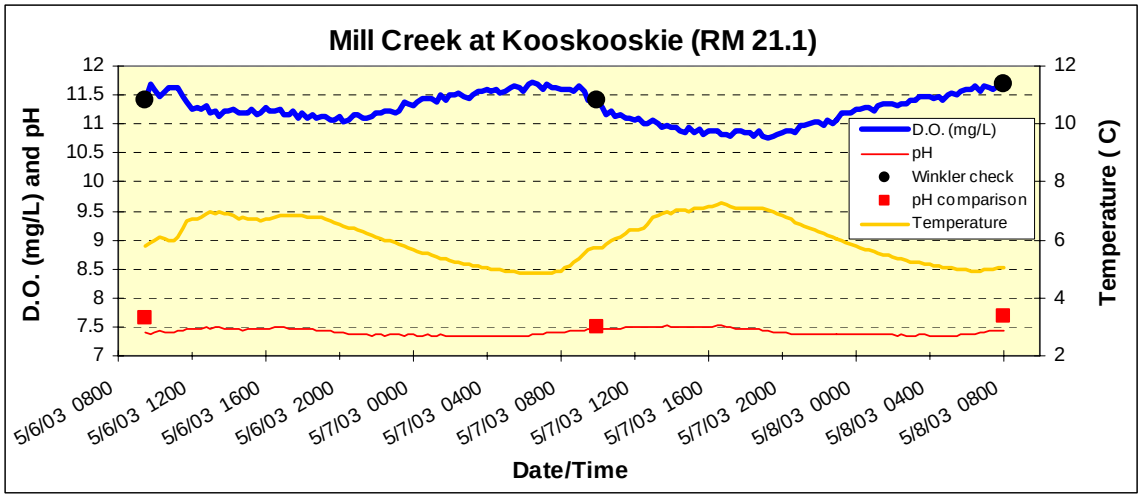


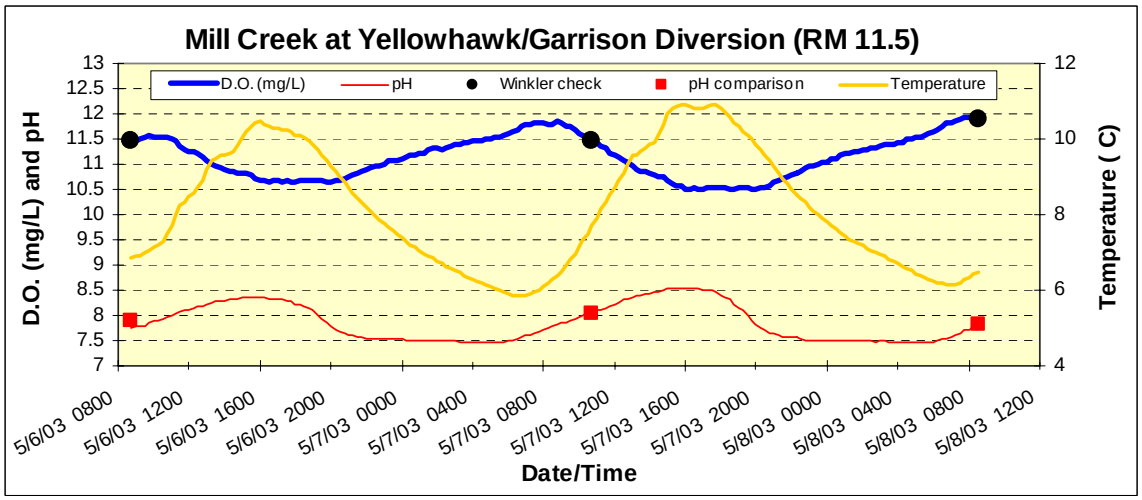


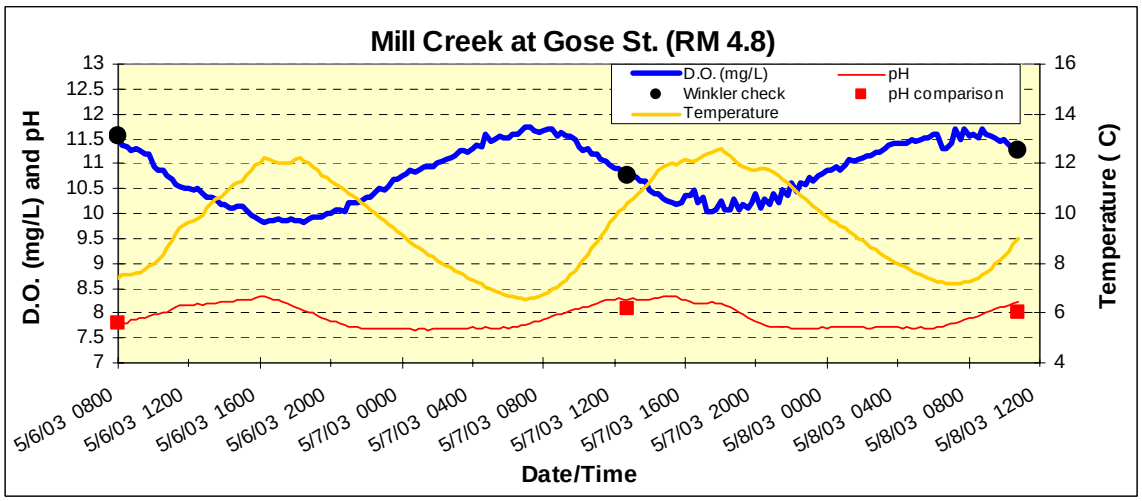
DataSonde® pH, dissolved oxygen (DO), and temperature taken every 15 minutes – August 12-15, 2002. Dissolved oxygen measurements were corrected to match Winkler checks. pH comparisons were taken with another calibrated DataSonde®.



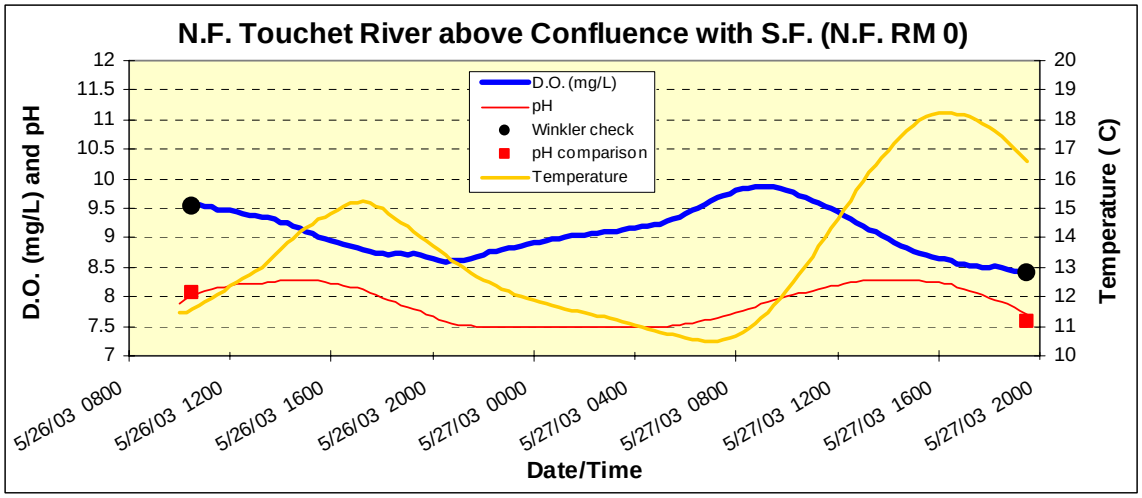
DataSonde® pH, dissolved oxygen (DO), and temperature taken every 15 minutes – September 18-19, 2002. Dissolved oxygen measurements were corrected to match Winkler checks. pH comparisons were taken with another calibrated DataSonde®.

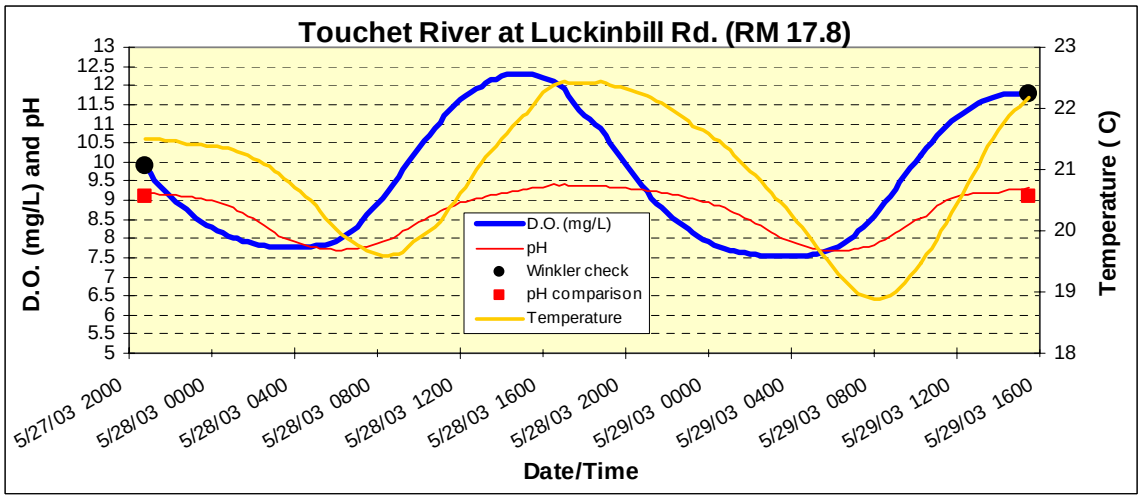






DataSonde® pH, dissolved oxygen (DO), and temperature taken every 15 minutes – May 6-8, 2003. Dissolved oxygen measurements were corrected to match Winkler checks. pH comparisons were taken with another calibrated DataSonde®.





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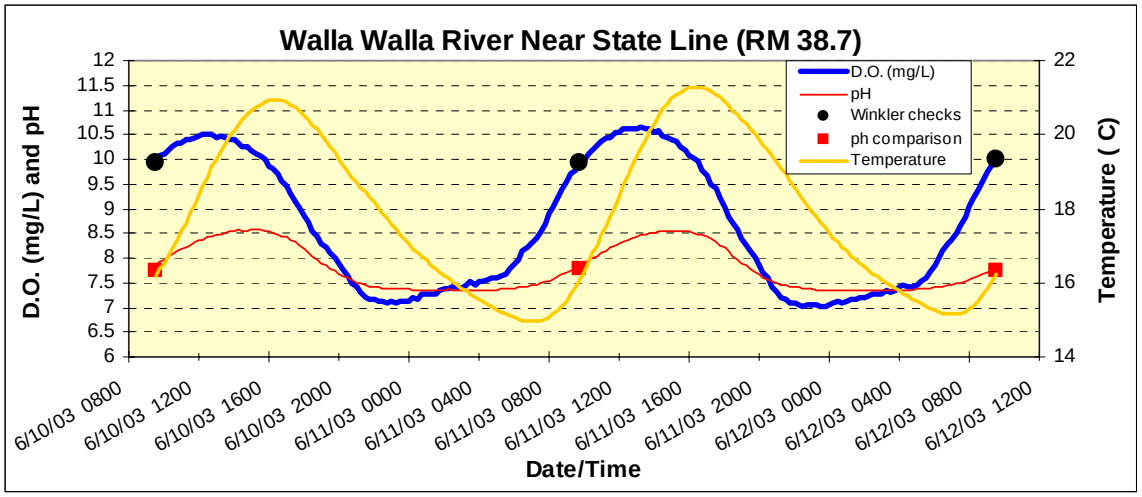
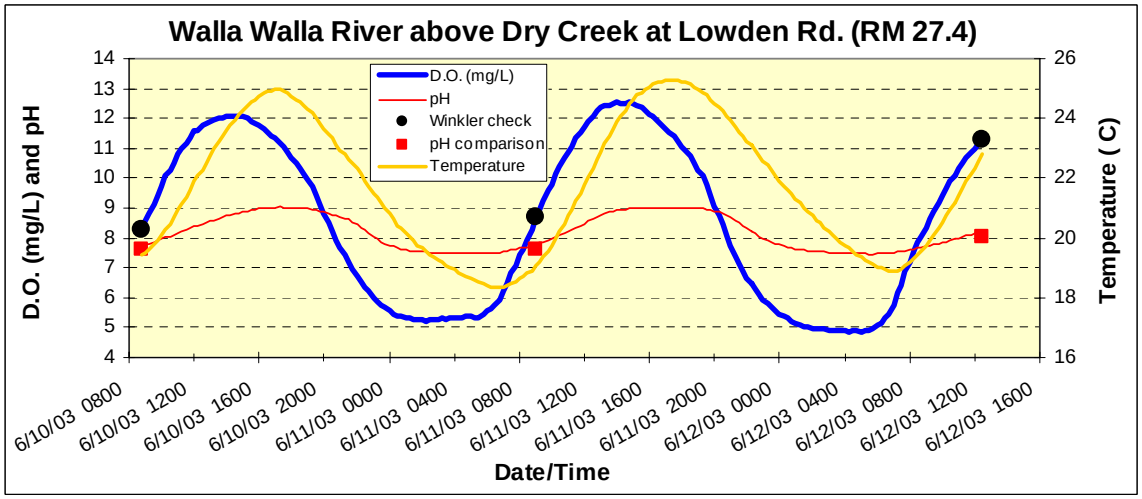
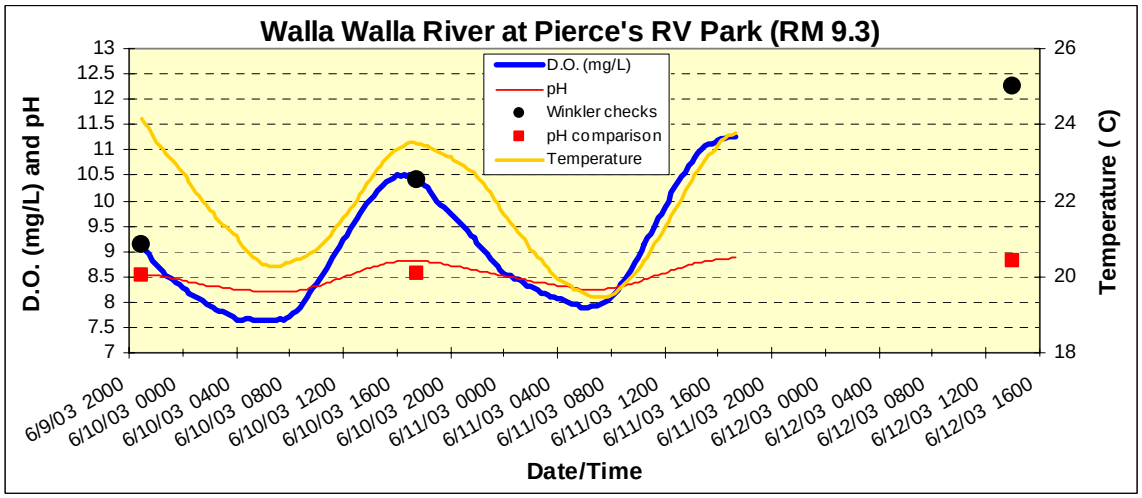
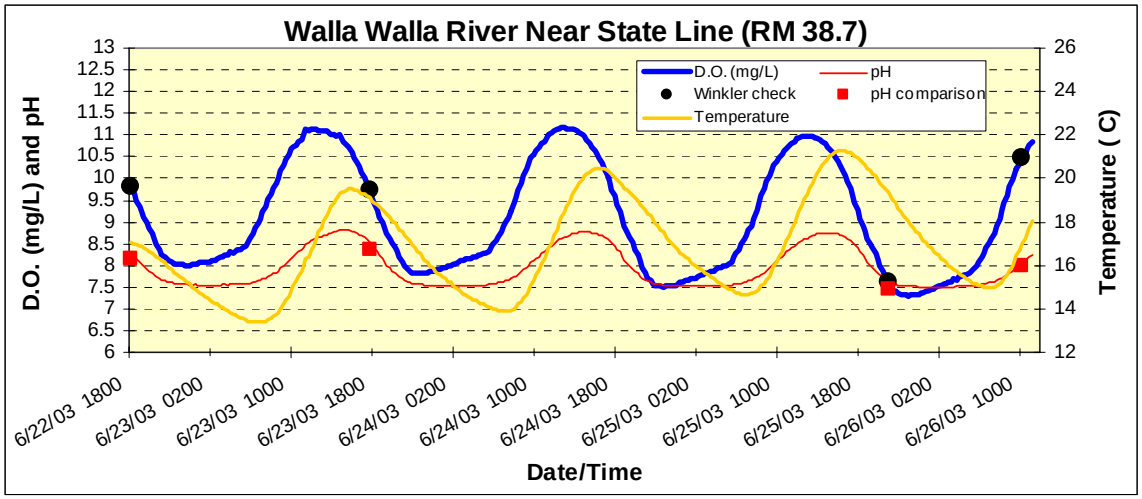
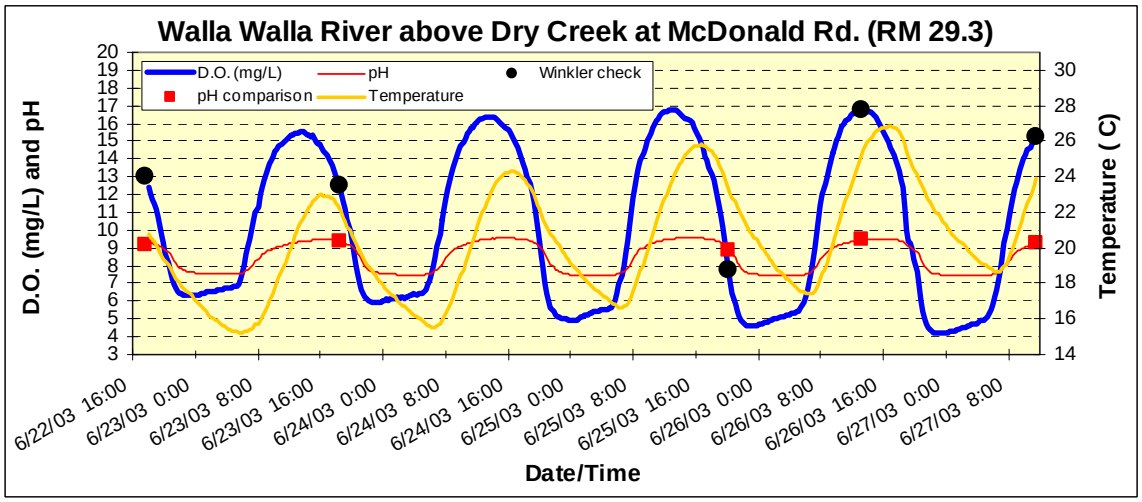




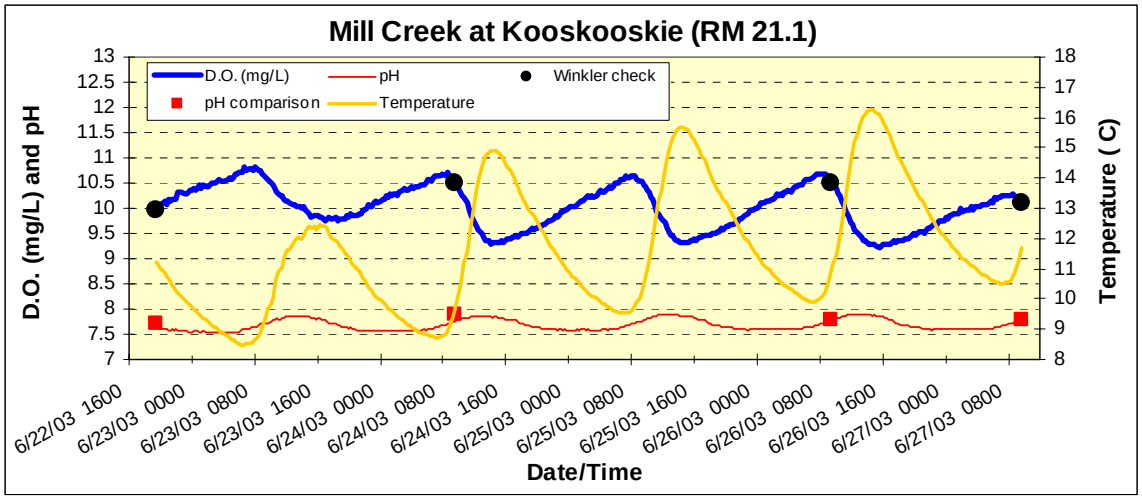


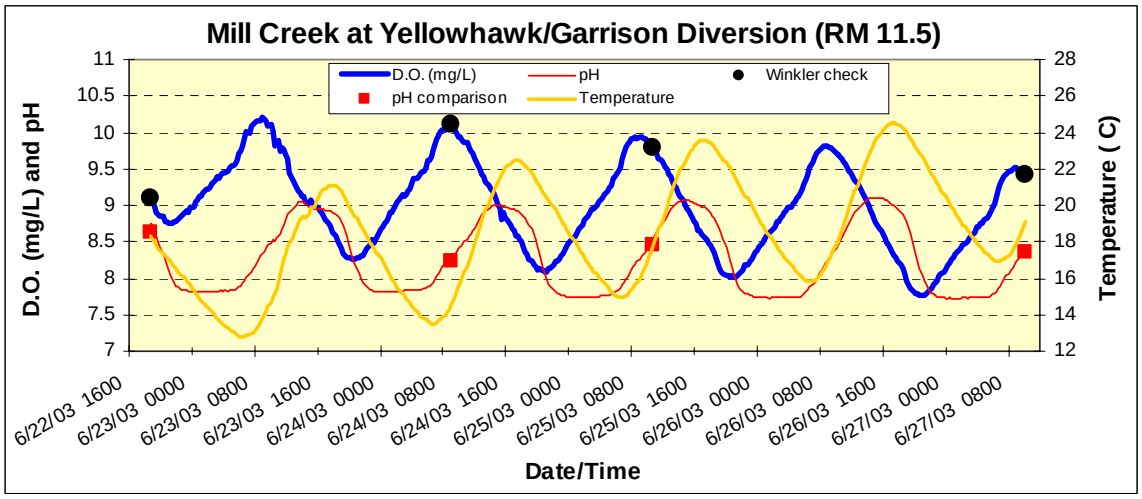
DataSonde® pH, dissolved oxygen (DO), and temperature taken every 15 minutes – June 10-12, 2003. Dissolved oxygen measurements were corrected to match Winkler checks. pH comparisons were taken with another calibrated DataSonde®.





DataSonde® pH, dissolved oxygen (DO), and temperature taken every 15 minutes – June 22-27, 2003. Dissolved oxygen measurements were corrected to match Winkler checks. pH comparisons were taken with another calibrated DataSonde®.





DataSonde® pH, dissolved oxygen (DO), and temperature taken every 15 minutes – June 22-27, 2003. Dissolved oxygen measurements were corrected to match Winkler checks. pH comparisons were taken with another calibrated DataSonde®.

Appendix F

pH and Dissolved Oxygen Time Series Charts

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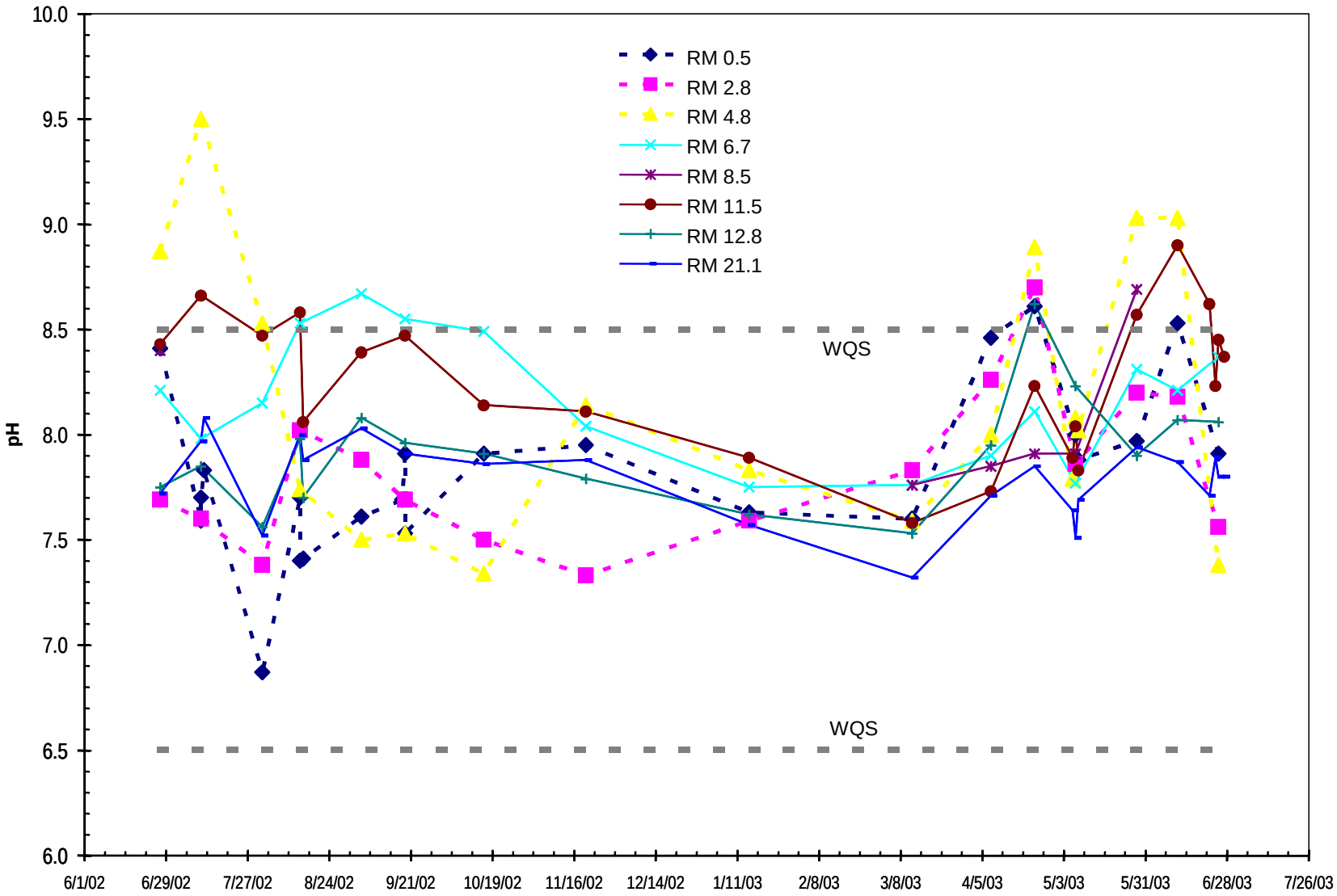
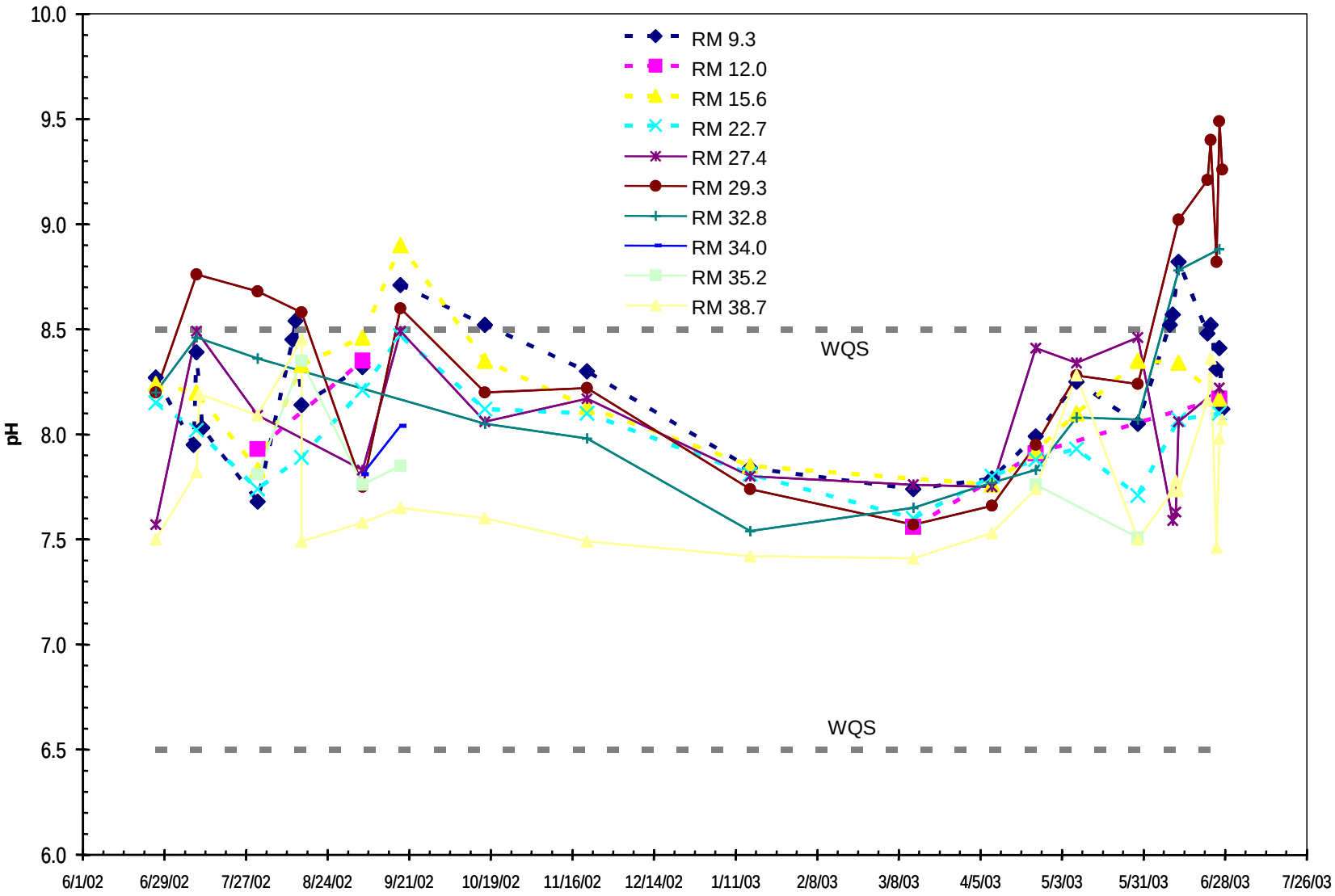
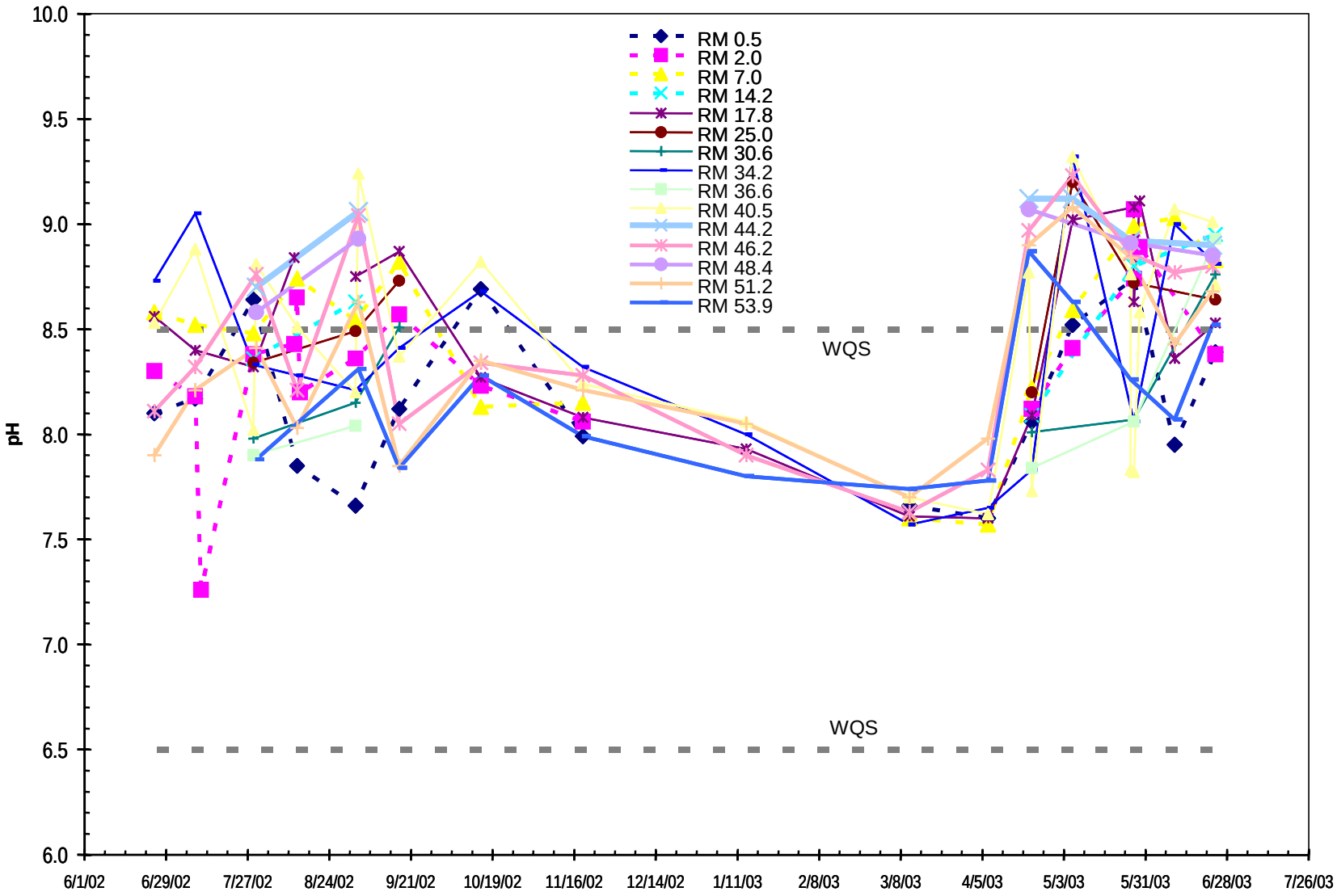


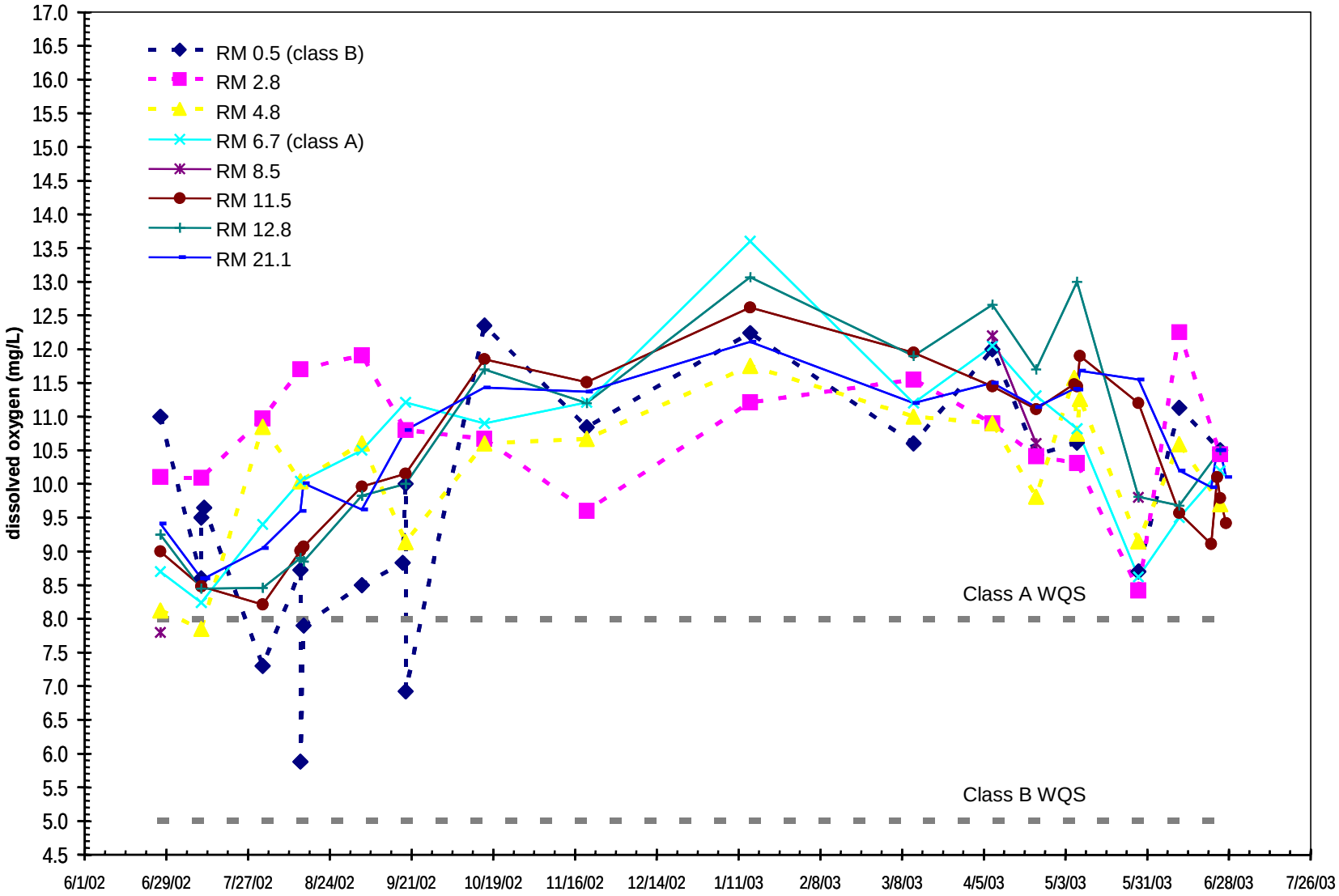
pH in Mill Creek from June 2002 through June 2003. Measurements were taken at different times during the day so comparisons between sites should be limited. WQS =Water Quality Standard. RM = River Mile.



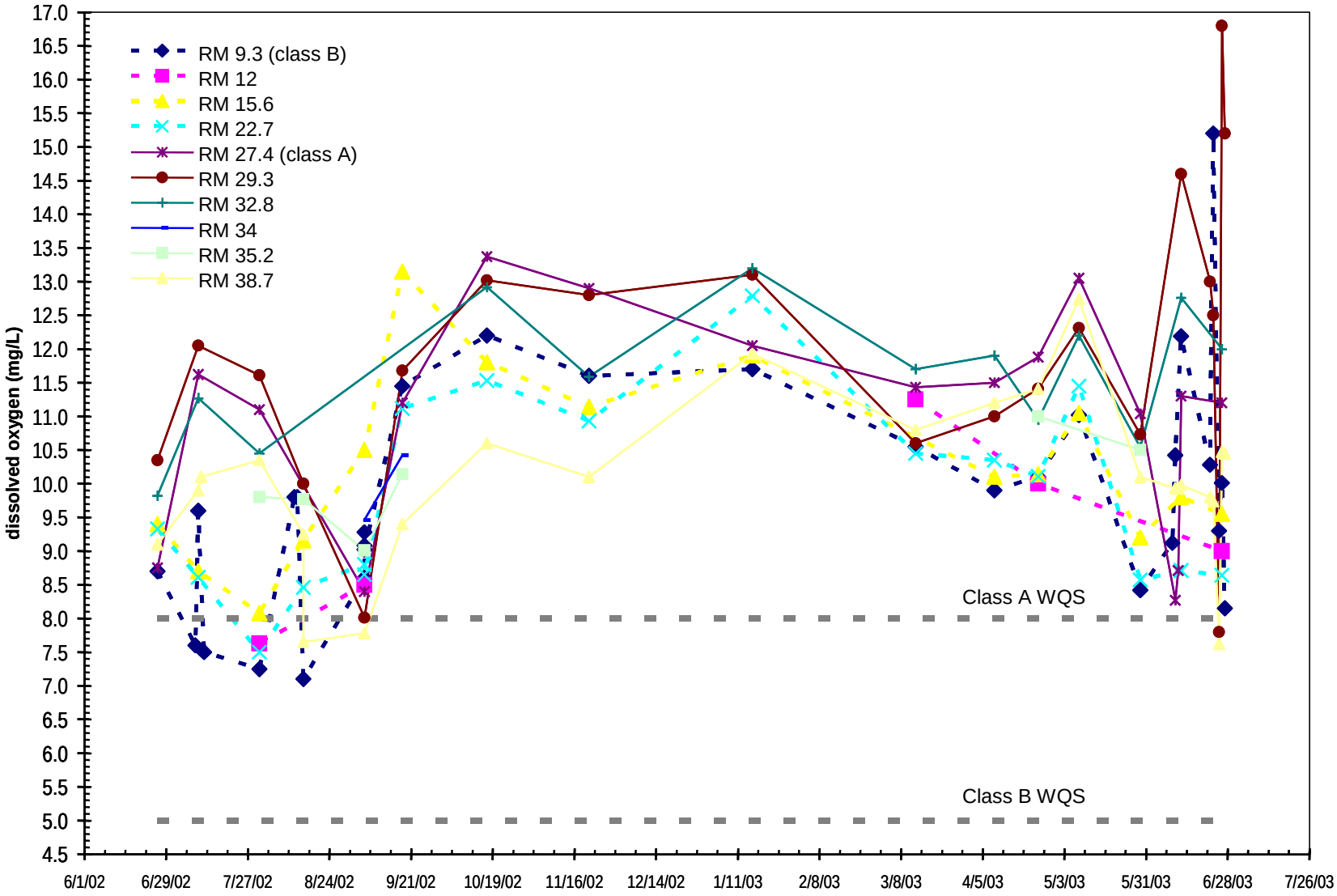
pH in the Walla Walla River from June 2002 through June 2003. Measurements were taken at different times during the day so comparisons between sites should be limited. WQS = Water Quality Standard. RM =River Mile.



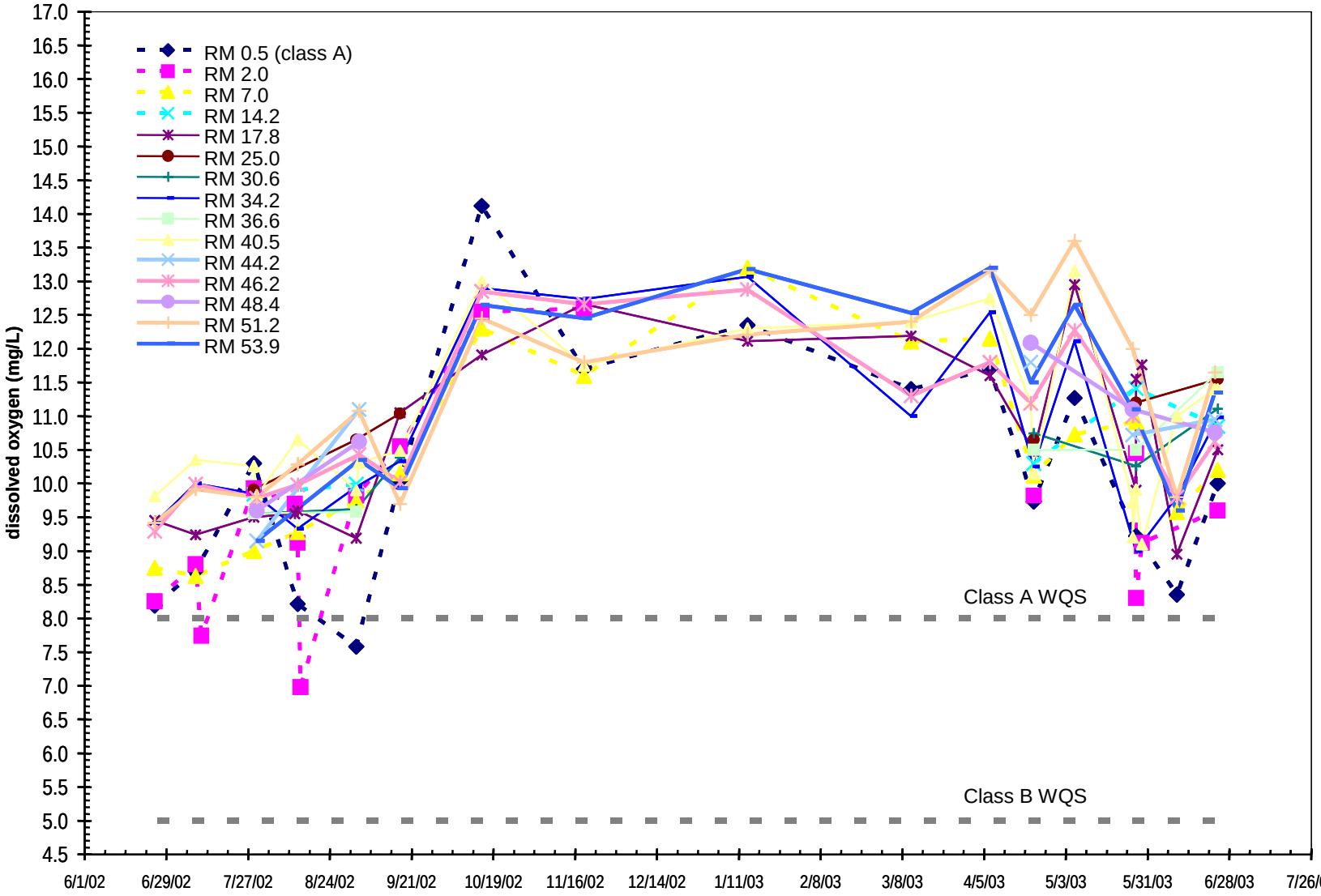
pH in the Touchet River from June 2002 through June 2003. Measurements were taken at different times during the day so comparisons between sites should be limited. WQS = Water Quality Standard. RM = River Mile.



Dissolved oxygen in Mill Creek from June 2002 through June 2003. Measurements were taken at different times during the day so comparisons between sites should be limited. WQS = Water Quality Standard. RM = River Mile.



Dissolved oxygen in the Walla Walla River from June 2002 through June 2003. Measurements were taken at different times during the day so comparisons between sites should be limited. WQS = Water Quality Standard. RM = River Mile.



Dissolved oxygen in the Touchet River from June 2002 through June 2003. Measurements were taken at different times during the day so comparisons between sites should be limited. WQS = Water Quality Standard. RM = River Mile.