River and Stream Ambient Monitoring Report for Water Year 2002

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River and Stream Ambient Monitoring Report for Water Year 2002

by
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Abstract

The Washington State Department of Ecology (Ecology) collected monthly water quality information at 85 stream monitoring stations during Water Year (WY) 2002 (October 1, 2001 through September 30, 2002), though four stations were only monitored during part of the year. We also collected 30-minute interval temperature data at 52 sites from June through September 2002. The principal goals of this ongoing monitoring program are to characterize the rivers and streams of Washington State and to track changes in water quality.

This report is intended to document methods and data quality, and to present the data for WY 2002. This year's annual report also includes a discussion of trend power. A description of our long-term monitoring program and access to historical data can be found on the Ecology Internet web site at http://www.ecy.wa.gov/ under "Environmental Info." and "Watersheds".

Introduction

The Washington State Department of Ecology (Ecology) and its predecessor agency have operated a long-term ambient water quality monitoring program since 1959. The current program consists of monthly water quality monitoring for conventional constituents at about 82 stations on rivers and streams within Washington State. (The actual number of stations varies slightly depending on funding and special projects.) In addition, in 2002 we continued programs to collect 30-minute interval temperature data at long-term stations from June through September and bi-monthly metals monitoring at a few selected stations.

The principal goals of the stream ambient monitoring program are to characterize stream water quality and to evaluate spatial and temporal changes in water quality (trends). Within Ecology, the data generated by the Freshwater Monitoring Unit (FMU) are used to determine if designated uses are supported (e.g., Ecology, 1998), refine and verify TMDL models, develop water quality based permits, prepare 305(b), 303(d), and other management reports, provide water quality information necessary to prioritize grant awards, and conduct miscellaneous site-specific evaluations. Our data are provided free to the public and are widely used by academics, consultants, local government entities, schools, and others interested in the quality of Washington's flowing waters.

The purpose of this report is to describe the Water Year (WY) 2002 monitoring program, discuss data quality, and present results. This WY's report also includes a discussion of trend power. More detailed analyses and interpretations of ambient monitoring data are reported elsewhere. The FMU analyzes results at specific stations in response to specific needs (e.g., Hallock, 2002). A generalized assessment of water quality at particular stations is provided online (http://www.ecy.wa.gov/programs/eap/fw_riv/rv_main.html) in the form of a water quality index (WQI; Hallock, 2002b). The WQI and trends at long-term stations are reported in "Condition of Freshwaters in Washington State for the Year 2000" (Plotnikoff, *et al.*, 2001). (Our reports are available through our web site.) Other programs conduct some analyses of their own; for example, Ecology's Water Quality Program applies its own data reduction procedures prior to producing Washington's 305(b) and 303(d) reports.

Methods

Sampling Network

The ambient monitoring network in WY 2002 consisted of monthly water collection at 62 long-term stations and 23 regional ("basin") stations. Of the basin stations, 19 were monitored year-round, and, after May 2002, two were dropped and two new stations added.

1. Long-term stations are monitored every year to track water quality changes over time (trends) and to assess inter-annual variability, as well as to collect current water quality information. These stations are generally located near the mouths of major rivers, below major population centers, upstream from most anthropogenic sources of water quality problems, or where major streams enter the state. We monitor 62 long-term stations.

2. Basin stations are generally monitored for one year only (although they may be re-visited every five years) to collect current water quality information. These stations are selected to support the waste discharge permitting process, TMDL assessments, site-specific needs, and to allow expanded coverage over a long-term network. Basin station sampling was focused (but not necessarily exclusively) in the following basins during WY 2002: Snake, Wenatchee, Nooksack/San Juan, and Western Olympics. Some basin stations are selected to target known problems and may not necessarily reflect ambient conditions.

The locations of ambient stations monitored during WY 2002 are presented in Table 1. Appendix A lists current and historical monitoring locations and the years they were monitored by Ecology and its predecessor agencies. Historical data for these stations are available from the FMU on request. Also, a description of our long-term monitoring program, access to historical data, and previous annual reports can be found on Ecology's internet web site at http://www.ecy.wa.gov/ under "Environmental Info." and "Watersheds."

Sample Collection and Analysis

The majority of water samples were collected as single near-surface grab samples from highway bridges. Twelve water quality constituents were monitored at all stations monthly in WY 2002 (Table 2). Sample collection and analytical methods are described in earlier annual reports (e.g., Hallock, et al., 1998), our field monitoring protocols (Ward, 2002), the FMU quality assurance documents (Hallock and Ehinger, 2003 and Hopkins, 1996), and Manchester Environmental Laboratory's (MEL) Laboratory User's Manual (Ecology, 2002).

Any long-term monitoring program will experience changes in sampling or analytical procedures that can potentially affect results. Normally, changes will result in improved precision or reduced bias. Most changes will have only a minor affect on a synoptic analysis of the data but even improvements in procedures can mislead the unwary analyst of long-term trends. We made no substantive changes to collection or analytical procedures in WY 2002, however some modifications were made to historical data and a bias was discovered in recent total phosphorus measurements (see the "Quality Assurance" section). All known and suspected changes to methods and procedures during the history of the stream monitoring program, as well as large-scale environmental changes that may affect a trend analysis are documented in Appendix B.

Table 1. Ecology stream ambient monitoring stations for Water Year 2002. (Status: L=long term; B=basin).

Station		Status	Station		Status
01A050	Nooksack R. @ Brennan	L	28H070	Campen Cr. nr Washougal	B
01A120	Nooksack R @ No Cedarville	L	31A070	Columbia R @ Umatilla	L
01A140	Nooksack R above the MF	B	32A070	Walla Walla R nr Touchet	L
01D080	Sumas R @ Jones Road	B	33A050	Snake R nr Pasco	L
01F070	SF Nooksack @ Potter Rd	B	34A070	Palouse R @ Hooper	L
01G070	MF Nooksack R	B	34A120	Palouse R at Colfax	B
01H070	Terrell Cr. nr Jackson Rd.	B	34A170	Palouse R @ Palouse	L
03A060	Skagit R nr Mount Vernon	L	34B110	SF Palouse R @ Pullman	L
03B050	Samish R nr Burlington	L	34H070	Pleasant Valley Cr blw St John	B
04A100	Skagit R @ Marblemount	L	35A150	Snake R @ Interstate Br	L
05A070	Stillaguamish R nr Silvana	L	35B060	Tucannon R @ Powers	L
05A090	SF Stillaguamish @ Arlington	L	35D070	Asotin Cr @ Asotin	B
05A110	SF Stillaguamish nr Granite Falls	L	35F110	Pataha Cr @ Rosy Grade	B
05B070	NF Stillaguamish @ Cicero	L	36A070	Columbia R nr Vernita	L
05B110	NF Stillaguamish nr Darrington	L	37A090	Yakima R @ Kiona	L
07A090	Snohomish R @ Snohomish	L	37A205	Yakima R @ Nob Hill	L
07C070	Skykomish R @ Monroe	L	37E120	Wide Hollow Creek @ Randall Park	B
07D050	Snoqualmie R nr Monroe	L	37G120	Ahtanum Cr. @ 62nd Ave	B
07D130	Snoqualmie R @ Snoqualmie	L	38A050	Naches R @ Yakima on US HWY 97 [a]	B
08C070	Cedar R @ Logan St/Renton	L	38G120	Cowiche Cr. @ Zimmerman rd	B
08C110	Cedar R nr Landsburg	L	39A050	Yakima R @ Harrison Bridge [a]	B
09A080	Green R @ Tukwila	L	39A090	Yakima R nr Cle Elum	L
09A190	Green R @ Kanaskat	L	41A070	Crab Cr nr Beverly	L
10A050	Puyallup R @ Puyallup	B	45A070	Wenatchee R @ Wenatchee	L
10A070	Puyallup R @ Meridian St	L	45A110	Wenatchee R nr Leavenworth	L
10C095	White River @ R Street	B	45C070	Chumstick Cr nr Leavenworth [b]	B
11A070	Nisqually R @ Nisqually	L	45E070	Mission Cr nr Cashmere [b]	B
13A060	Deschutes R @ E St Bridge	L	46A070	Entiat R nr Entiat	L
16A070	Skokomish R nr Potlatch	L	48A070	Methow R nr Pateros	L
16C090	Duckabush R nr Brinnon	L	48A140	Methow R @ Twisp	L
18A050	Dungeness R nr Mouth	B	49A070	Okanogan R @ Malott	L
18B070	Elwha R nr Port Angeles	L	49A190	Okanogan R @ Oroville	L
20B070	Hoh R @ DNR Campground	L	49B070	Similkameen R @ Oroville	L
22A070	Humptulips R nr Humptulips	L	53A070	Columbia R @ Grand Coulee	L
23A070	Chehalis R @ Porter	L	54A120	Spokane R @ Riverside State Pk	L
23A100	Chehalis R @ Prather Rd	B	55B070	Little Spokane R nr Mouth	L
23A160	Chehalis R @ Dryad	L	56A070	Hangman Cr @ Mouth	L
24B090	Willapa R nr Willapa	L	57A150	Spokane R @ Stateline Br	L
24F070	Naselle R nr Naselle	L	60A070	Kettle R nr Barstow	L
26B070	Cowlitz R @ Kelso	L	61A070	Columbia R @ Northport	L
27B070	Kalama R nr Kalama	L	62A090	Pend Oreille @ Metaline Falls	B
27D090	EF Lewis R nr Dollar Corner	L	62A150	Pend Oreille R @ Newport	L
28G070	Gibbons Ck nr Washougal	B			

[a] Stations were dropped after May, 2002 except for metals monitoring at 38A050.
[b] Stations were added in June, 2002.

Table 2. Standard water quality constituents monitored at all stations monthly in Water Year 2002 as part of Ecology's river and stream ambient monitoring program.

conductivity	suspended solids, total	phosphorus, total
oxygen, dissolved	turbidity	ammonia, total
pH	fecal coliform bacteria	nitrate + nitrite, total
temperature	phosphorus, soluble reactive	nitrogen, total

Continuous Temperature Monitoring

In the summer of 2002, the Environmental Monitoring and Trends Section (EMTS) continued for a second year collecting temperature data at 30-minute intervals at most of our long-term ambient monitoring stations as well as some basin stations. Fifty-two sites were monitored in 2002. The purpose of this monitoring is to collect season-long diurnal temperature data that may be used for trend analyses and to determine compliance with current and proposed water quality standards.

Two Onset Stow Away TidbiT® temperature loggers were deployed at each station, one in water and one in air. All loggers were shaded with a PVC pipe and installed in a location representative of the surrounding environment. Stream loggers were installed about six inches off the stream bottom to minimize potential influence from groundwater inflow. Loggers were placed in a free flowing location at a depth to avoid exposure to air resulting from low flows.

We deployed the loggers in June and July and retrieved them in September. Detailed protocols will be written and incorporated by reference in future annual reports.

Metals Monitoring

Renewed funding allowed us to resume metals monitoring in WY 2002 after a two-year interruption. Metals samples were collected bi-monthly beginning in October at 12 stations (Table 3). Samples were analyzed for hardness, total mercury, and total recoverable and dissolved arsenic, cadmium, chromium, copper, lead, nickel, silver, and zinc. Collection and analytical methods are discussed in more detail in Hopkins (1996).

Table 3. Stations where metals were monitored bi-monthly in WY 2002.

Station	Name	Station	Name
01A050	Nooksack R. @ Brennan	38A050	Naches R @ Yakima on US HWY 97
01G070	MF Nooksack R	46A070	Entiat R nr Entiat
05B110[a]	NF Stillaguamish nr Darrington	48A140	Methow R @ Twisp
11A070	Nisqually R @ Nisqually	55B070	Little Spokane R nr Mouth
13A060	Deschutes R @ E St Bridge	57A150	Spokane R @ Stateline Br
23A070	Chehalis R @ Porter	60A070	Kettle R nr Barstow

[a] December's sample was inadvertently collected at station 08C110 (Cedar River nr Landsburg).

Trend Power

The ability to evaluate trends in water quality is one of the unique strengths of our ambient monitoring program. Trend analyses, however, including our own, frequently fail to report the power of the analysis, and report only whether or not a trend was detected. A failure to reject the null hypothesis of "no trend" is often used to improperly conclude that there was no trend, when in reality there may have simply been insufficient data or too much variance in the data to allow trend detection at the specified level of confidence. The following similar statements in fact have very different meanings:

1. "We were unable to detect a trend; given the variance in the data, we would expect to detect trends in excess of 10 percent of the mean."
2. "We were unable to detect a trend; given the variance in the data, we would expect to detect trends in excess of 400 percent of the mean."

In simple terms, given the first statement one might reasonably conclude that a large trend was probably not present. The second statement, on the other hand, effectively says only that there was too much variability in the data to make conclusions about trend given the number of samples collected.

In order to get some idea of the trend power we might expect from our monthly ambient monitoring data, I calculated the minimum detectable trend (MDT) for several constituents at 6 stations in different ecoregions and with different flow regimes (a total of 32 datasets). Data were collected between October 1992 and September 2002. Each dataset was detrended by subtracting the Sen slope estimate using WQHydro software (Aroner, 2002). Trends of increasing magnitude were then added back until the seasonal Kendall test for trend rejected the null hypothesis of "no trend" at the 90 percent confidence level. The amount of trend required for detection was expressed as a percent of the mean for the 10-year period.

The empirical power analysis above is cumbersome. For normally distributed data, trend power may be determined from the equation

$$\Delta\mu = s_{obs} * \delta \qquad 1)$$

where $\Delta\mu$ is the minimum change in the mean that can be detected, s_{obs} is the total standard deviation of the deseasonalized, detrended data, and δ is the "minimum relative detectable

trend," which, for ten years of independent monthly data, $\alpha = 0.1$, and $\beta = 0.1$, is 0.932. (For 5 and 15 years, respectively, $\delta = 1.327$ and 0.759; see Hallock and Ehinger, 2003). The 32 datasets were deseasonalized by subtracting the seasonal medians and detrended and s_{obs} and $\Delta\mu$ calculated for the adjusted data.

Water quality data, however, are usually not normally distributed and the estimates from Equation 1) were frequently very poor compared to empirically determined MDTs. I developed a simple correction factor based on the difference between the median and the mean (an indication of non-normality) that can be applied to $\Delta\mu$ determined from Equation 1 to provide much better estimates of power.

Quality Assurance

MEL's Quality Assurance (QA) Program includes the use of quality control charts, check standards, in-house matrix spikes and laboratory blanks, along with performance evaluation samples. For a more complete discussion of laboratory quality assurance, see MEL's Quality Assurance Manual (Ecology, 2001) and Laboratory User's Manual (Ecology, 2002).

The QA program for field sampling consisted of three parts: (1) adherence to a procedures manual for sample/data collection (Ward, 2002) and periodic evaluation of sampling personnel, (2) instrument calibration methods and schedules, and (3) the collection of a field quality control (QC) sample twice during each sampling run. Our QA program is described in detail in Hallock and Ehinger (2003).

The following three types of field QC samples were collected.

- Duplicate (Sequential) Field Samples - These consisted of an additional sample collection made approximately 15-20 minutes after the initial collection at a station. These samples represent the variability due to short-term in-stream processes, sample collection and processing, and laboratory analysis.

- Duplicate (Split) Field Samples - These consisted of one sample (usually the sequential duplicate) split into two containers that are processed as individual samples. This eliminates the in-stream variability and isolates the variability to that due to field processing and laboratory analysis.

- Field Blank - These consisted of the submission and analysis of deionized water. The expected value for each analysis is the reporting limit for that analysis. Significantly higher results would indicate that sample contamination had occurred during field processing or during laboratory analysis.

QC samples were submitted semi-blind to the laboratory (they were identified as QC samples, but sample type (duplicate, split, or blank) and station were not identified).

Eighty-eight field QC samples were processed, 8 field blanks and 80 field splits and sequential samples. In addition, the laboratory analyzed some field QC samples in duplicate (*i.e.*, lab split of the field QC sample). The central tendency of the variance of pairs of split field samples was

summarized by calculating the square root of the mean of the sample-pair variances (root-mean-square - RMS). These figures provide an unbiased (and higher) estimate than other commonly used statistics (for example, mean or median of the standard deviations).

A two-tiered system was used to evaluate data quality of individual results. The first tier consisted of four automated checks: holding time, variability in field duplicates, reasonableness of the result, and stoichiometric balance of nutrient species. Results exceeding pre-set limits were flagged. The second tier QC evaluation was a manual review of the data flagged in the first tier. Data were then coded from one through nine (one = data meets all QA requirements, nine = data are unusable). Data with quality codes greater than four are generally not distributed outside the agency.

The quality of the continuous temperature data was assessed by calibration checks utilizing a certified reference thermometer before and after a deployment. If a pre-survey calibration check indicated a logger's accuracy was not within the required limits (either 0.2 °C for water or 0.4 °C for air) when compared to a certified reference thermometer then the logger was rejected and not deployed. If a logger failed a post-survey calibration check then the results may be rejected or possibly adjusted. In addition, the data were compared to field temperature measurements taken at deployment and retrieval with a calibrated alcohol thermometer. Results were also compared to the monthly measurements collected during normal monitoring surveys. All data were reviewed graphically and anomalies were deleted prior to loading the results into the database.

Results and Discussion

The primary purpose of this report is to present the results of Ecology's stream monitoring in WY 2002. Appendix C contains results for each station monitored in WY 2002. Raw data are available in computer formats on request and the most recent published WY's data are posted on Ecology's World Wide Web pages (http://www.ecy.wa.gov/). (Unpublished data are also available on-line but are considered "preliminary".)

A station-by-station data analysis is not within the scope of this report. Individual results exceeding the water quality criteria in Washington's Water Quality Standards (Washington Administrative Code, Chapter 173-201A) are identified in reports on our web site (http://www.ecy.wa.gov/apps/watersheds/riv/exceed/). The numeric criteria from the Water Quality Standards are presented in Table 4.

Table 4. Water quality criteria used to evaluate monitoring results. (Results outside the ranges indicated are considered to exceed the criterion.) WAC 173-201A-130 identifies exceptions to the standard criteria for some stream segments. Metals criteria, most of which are a function of hardness, are not listed here.

				Fecal Coliform	
Class	Temperature	Oxygen	pH	10 Percent	Geometric mean
AA	<=16°C	>9.5 mg/L	6.5<=pH<=8.5	<=100	<=50
A	<=18°C	>8.0 mg/L	6.5<=pH<=8.5	<=200	<=100
B	<=21°C	>6.5 mg/L	6.5<=pH<=8.5	<=400	<=200

Had the twelve standard constituents (Table 2) been recorded at all stations and all dates, 11,952 results would have been added to our database for WY 2002 (excluding QC results and non-standard constituents like flow, barometric pressure, and metals). However, 55 results (0.5 percent) were missed (Appendix D). Three stations were inaccessible on one occasion each accounting for 36 missed results. The remaining samples were missed because water velocity was too high for the temperature probe to submerge (1), bottles were broken during shipping (2), the sampler failed to record results or to ship samples (7), and delayed delivery of samples to the lab (9). In addition, the lab filtered 51 total nitrogen and/or total phosphorus samples prior to analysis due to excessive sediment. These results were reported as "dissolved" rather than "total."

Instantaneous discharge was recorded at 59 of the 62 long-term stations. Flows for two stations, Nisqually River at Nisqually and East Fork Lewis River near Dollar Corner, are coded as estimates because the nearest gage was a considerable distance upstream. Flow results from these stations should be used with caution. Flow may become available in the future for one additional long-term station: Pend Oreille River at Newport. Flow data was not available for South Fork Stillaguamish River at Arlington and the Humptulips River near Humptulips. Discharge was recorded at 12 of the 23 basin stations.

Continuous Temperature Monitoring

Seasonal maximums and the maximum seven-day average of daily maximums are listed in Table 5 for the 52 stations we monitored in 2002. The seasonal maximum at most stations (39) exceeded current water quality criteria. (A new temperature criterion of 16˚C based on the maximum seven-day average is being proposed for most streams in Washington. Forty-five stations would have exceeded this criterion.) The warmest stations (and their maximum temperatures, ºC) were 56A070, Hangman Creek (33.2), 32A070, Walla Walla River (30.7), 34A170, Palouse River (30.5), and 41A070, Crab Creek (30.5).

Table 5. Temperature Monitoring (30-Minute Intervals; °C) - Summary for Water Year 2002.

	Deployment Maximum		Max 7-day Mean [b]			
Station	Max	Date/Time [a]	Max	Date [a,c]	Deploy	Retrieve
01A050	17.1	2002-08-23 18:00:00	16.7	2002-08-26	2002-07-22	2002-09-16
01A120	17.7	2002-08-14 18:30:00	17.3	2002-08-13	2002-07-23	2002-09-16
01A140	15.9	2002-08-22 17:30:00	15.5	2002-08-12	2002-07-23	2002-09-16
01D080	19.7	2002-07-24 19:00:00	18.2	2002-07-26	2002-07-23	2002-09-16
01F070	21.1	2002-08-14 19:00:00	20.0	2002-08-13	2002-07-23	2002-09-16
01G070	13.1	2002-07-25 18:00:00	12.4	2002-08-11	2002-07-23	2002-09-16
03B050	18.4	2002-07-23 18:30:00	16.8	2002-08-13	2002-07-23	2002-09-16
04A100	13.2	2002-08-27 18:30:00	13.0	2002-08-26	2002-07-24	2002-09-17
05A070	21.7	2002-08-14 21:00:00	20.9	2002-08-14	2002-07-24	2002-09-18
05A090	21.7	2002-08-14 19:00:00	20.9	2002-08-14	2002-07-24	2002-09-18
05A110	18.9	2002-08-29 15:30:00	18.0	2002-08-27	2002-07-22	2002-09-18
05B070	20.7	2002-08-13 19:00:00	19.9	2002-08-13	2002-07-24	2002-09-18
05B110	17.3	2002-08-28 16:30:00	16.8	2002-08-13	2002-07-24	2002-09-17
07C070	18.8	2002-08-14 20:30:00	18.3	2002-08-14	2002-07-22	2002-09-18
07D050	20.2	2002-08-15 17:30:00	19.7	2002-08-15	2002-07-22	2002-09-18
07D130	19	2002-08-13 20:30:00	18.4	2002-08-14	2002-07-22	2002-09-18
08C070	19.8	2002-07-24 18:30:00	18.3	2002-08-14	2002-07-24	2002-09-17
08C110	14.4	2002-07-24 18:30:00	13.1	2002-07-25	2002-07-22	2002-09-18
09A080	21.4	2002-08-14 20:30:00	20.7	2002-08-14	2002-07-24	2002-09-17
10A050	18	2002-08-09 23:30:00	17.5	2002-08-11	2002-07-18	2002-09-25
10C085	22.7	2002-07-23 18:30:00	21.3	2002-07-21	2002-06-10	2002-09-25
10C095	22.2	2002-07-23 18:00:00	20.9	2002-07-21	2002-06-10	2002-09-25
10C115	17.6	2002-07-22 19:00:00	16.8	2002-07-23	2002-06-10	2002-09-25
10C135	17.4	2002-07-25 00:00:00	16.8	2002-07-24	2002-06-10	2002-09-25
11A070	15.7	2002-07-23 19:00:00	15.3	2002-07-21	2002-07-18	2002-09-23
13A060	20	2002-07-23 18:30:00	19.1	2002-07-21	2002-07-10	2002-09-23
16A070	15.4	2002-07-24 17:30:00	15.0	2002-07-21	2002-07-15	2002-09-23
16C090	13.7	2002-08-14 18:00:00	13.2	2002-08-14	2002-07-15	2002-09-23
18A050	17.8	2002-08-13 17:30:00	17.2	2002-08-13	2002-07-15	2002-09-23
18B070	16.6	2002-09-13 17:30:00	16.3	2002-09-12	2002-07-15	2002-09-23
20B070	17.5	2002-08-13 20:30:00	17.0	2002-08-12	2002-07-15	2002-09-23
22A070	22	2002-07-22 19:00:00	20.6	2002-08-14	2002-07-15	2002-09-23
23A070	24.5	2002-07-23 17:30:00	23.1	2002-07-22	2002-07-15	2002-09-23
24B090	24.8	2002-07-22 17:30:00	22.7	2002-07-23	2002-07-16	2002-09-24
24F070	20.9	2002-08-13 18:00:00	19.4	2002-08-15	2002-07-16	2002-09-24

Station	Deployment Maximum Max	Date/Time [a]	Max 7-day Mean [b] Max	Date [a,c]	Deploy	Retrieve
26B070	19.4	2002-07-22 16:00:00	17.8	2002-08-11	2002-07-16	2002-09-24
27B070	19.2	2002-07-24 19:00:00	18.5	2002-07-22	2002-07-16	2002-09-24
27D090	25	2002-08-13 17:00:00	23.9	2002-08-15	2002-07-16	2002-09-24
32A070	30.7	2002-07-13 16:30:00	28.3	2002-07-14	2002-07-11	2002-10-01
34A170	30.5	2002-07-13 18:00:00	29.1	2002-07-14	2002-07-11	2002-10-01
34B110	25.1	2002-07-13 18:00:00	23.8	2002-07-14	2002-07-11	2002-10-01
35B060	27.5	2002-07-12 18:30:00	26.1	2002-07-14	2002-07-11	2002-10-01
37A205	21.3	2002-07-13 18:30:00	20.0	2002-08-28	2002-07-08	2002-11-25
39A090	20.7	2002-08-14 16:30:00	20.2	2002-08-15	2002-07-08	2002-11-22
41A070	30.5	2002-07-13 18:00:00	28.6	2002-07-14	2002-07-10	2002-11-22
46A070	22.3	2002-08-14 17:00:00	20.9	2002-08-13	2002-07-09	2002-10-08
48A140	20	2002-08-23 18:00:00	18.7	2002-08-25	2002-07-09	2002-11-05
49A190	27.7	2002-07-13 0:30:00	26.7	2002-07-14	2002-07-09	2002-11-05
55B070	19.1	2002-07-12 20:30:00	18.4	2002-07-14	2002-07-10	2002-09-27
56A070	33.2	2002-07-10 18:00:00	27.8	2002-07-13	2002-07-10	2002-09-27
57A150	23.6	2002-08-28 18:00:00	23.0	2002-08-02	2002-07-30	2002-09-27
60A070	24.4	2002-07-24 17:00:00	23.9	2002-07-24	2002-07-12	2002-10-02

[a] There may be other dates or other seven day periods with the same maximum.
[b] This is the seven-day period with the highest average of daily maximum temperatures.
[c] Date shown is middle of seven day period.

Metals Monitoring

During the WY, of 1225 possible results (12 stations x 6 months x 17 metals analytes), 1215 results were reported. Of these, 10 exceeded water quality criteria; eight of those were from the Spokane River at Stateline (Table 6).

Table 6. Metals results from WY 2002 exceeding water quality standards criteria (µg/L).

Station	Name	Date	Metal	Criterion	Hardness	Result	Percent Exceeds Criterion
01G070	MF Nooksack R	18-Jun-02	Mercury, Total	0.012	NA	0.018	50
05B110	NF Stillaguamish nr Darr.	27-Feb-02	Mercury, Total	0.012	NA	0.015	25
57A150	Spokane R @ Stateline	09-Apr-02	Lead, Dissolved	0.534	24.7	0.549	3
57A150	Spokane R @ Stateline	04-Jun-02	Lead, Dissolved	0.37	17.8	1.77	380
57A150	Spokane R @ Stateline	15-Oct-01	Zinc, Dissolved	30.7	23.6	31.5	2
57A150	Spokane R @ Stateline	03-Dec-01	Zinc, Dissolved	30.5	23.4	55.1	80
57A150	Spokane R @ Stateline	12-Feb-02	Zinc, Dissolved	31.8	24.7	61.3	92
57A150	Spokane R @ Stateline	09-Apr-02	Zinc, Dissolved	32.0	24.7	71.8	125
57A150	Spokane R @ Stateline	04-Jun-02	Zinc, Dissolved	24.2	17.8	49.1	103
57A150	Spokane R @ Stateline	13-Aug-02	Zinc, Dissolved	24.9	18.4	34.6	39

Trend Power

Trend power was evaluated for 27 datasets. (Five of the original 32 datasets were eliminated because more than 25 percent of the results were below reporting limits. The methodology used to empirically determine trends fails when there are lots of tied values.) Empirically determined minimum detectable trends (MDT) ranged from a low 2 percent change in the mean over 10 years, to a high of 36 percent (Table 7). Highly variable constituents like fecal coliform bacteria and suspended solids tended to have the greatest MDT, while relatively consistent (and normally distributed) constituents like oxygen had the lowest.

Predicted MDTs calculated with Equation 1 (and expressed as a percent of the mean) were similar to empirically determined MDTs for normally distributed constituents, but as much as 50 times too high for non-normal constituents. The prediction was greatly improved by multiplying by a relatively simple correction factor (CF) based on non-normality of the dataset as measured by the difference between the mean and the median (Equation 2):

$$CF = (1 + \frac{\bar{x} - median}{\bar{x}})^{-6} \qquad 2)$$

where $\bar{x}$ is the mean.

The exponent in Equation 2 was chosen empirically to provide the best estimate. A correction factor based on the skewness coefficient was also derived, but it did not yield any better results and is more cumbersome to produce.

Predicted MDTs, then, may be corrected for non-normality and expressed as a percent of the mean by combining Equations 1 and 2 and dividing by the mean times 100:

$$\Pr edMDT = \frac{100}{\bar{x}} * s_{obs} * \delta * (1 + \frac{\bar{x} - median}{\bar{x}})^{-6} \qquad 3)$$

Equation 3 is still not very precise—it yielded results within a factor of 2 of the empirically determined MDT (Table 7)—but it may be useful in making gross estimates of MDT prior to establishing long-term monitoring programs with possibly unrealistic trend-detection objectives.

The above analysis assumes there is no significant autocorrelation. Power will be effectively reduced if autocorrelation is present. On the other hand, trend power can be improved by removing additional variance from the data. This can be done by several techniques, most commonly by removing variance due to discharge. Another useful technique to reduce variance (i.e., minimize s_{obs}) where paired upstream/downstream data are available is to analyze trends in the differences between the two datasets (see Hallock, 2002). Trends on these adjusted datasets, however, do not address quite the same question as trends on the unadjusted data, and must be reported and interpreted carefully.

Table 7. Minimum detectable trends for different datasets.

Station	Number of Samples	Correction Factor (CF)	S_{obs} (ds/dt) [a]	Median	Mean	Empirical Trend	Calculated Trend [b]	Adjusted Calc. Trend [c]
Conductivity (µs/cm)								
04A100	95	1.007	7.382	47	47.1	7%	16%	16%
55B070	93	1.351	32.57	244	232.1	10%	15%	11%
Fecal Coliform Bacteria (colonies/100mL)								
03A060	119	23.641	166	10.4	34	20%	457%	19%
34B110	94	29.176	2580	215	876	23%	311%	11%
55B070	104	4.098	32.82	32	43.5	31%	76%	18%
Nitrogen, total (mg/L)								
04A100	106	1.521	0.0418	0.09	0.097	20%	43%	28%
31A070	57	1.975	0.0771	0.277	0.315	15%	33%	17%
55B070	105	1.303	0.1195	1.26	1.206	6%	10%	8%
Nitrate+Nitrite-Nitrogen (mg/L)								
04A100	119	1.139	0.0168	0.066	0.067	10%	23%	20%
55B070	105	1.360	0.1571	1.14	1.083	6%	14%	11%
Oxygen (mg/L)								
03A060	119	1.045	0.4043	11.405	11.49	2%	3%	3%
04A100	120	1.005	0.3565	11.91	11.92	2%	3%	3%
31A070	56	1.040	0.5545	11.275	11.35	9%	7%	6%
34B110	95	1.234	1.314	10.3	9.95	10%	14%	11%
55B070	105	1.064	0.6303	9.9	9.80	3%	6%	6%
61A070	120	1.051	0.5729	11.7	11.60	3%	5%	4%
pH (standard units)								
55B070	106	1.068	0.2797	8.1	8.01	2%	3%	3%
Phosporus, soluble reactive (mg/L)								
55B070	106	1.824	0.0059	0.013	0.015	15%	40%	22%
Phosphorus, total (mg/L)								
31A070	57	2.240	0.0212	0.025	0.029	35%	99%	44%
34B110	95	5.036	0.4403	0.659	0.954	20%	48%	10%
55B070	105	1.801	0.0263	0.034	0.038	20%	69%	38%
Suspended Solids (mg/L)								
31A070	57	3.960	6.0263	5	6.74	36%	122%	31%
34B110	95	47.370	406	9	92	8%	463%	10%
55B070	106	2.558	4.3518	8	9.63	23%	45%	18%
Temperature (˚C)								
04A100	120	1.109	1.0675	6.75	6.87	9%	14%	13%
55B070	106	1.430	1.4647	8.75	9.32	7%	16%	11%
Turbidity (NTU)								
55B070	105	6.107	3.5867	3.1	4.78	14%	75%	12%

[a] Standard deviation of deseasonalized, detrended data.

[b] Based on equation 1.

[c] Calculated trend multiplied by a correction factor (Equation 3).

Quality Assurance

In 2002 we collect more than 15,000 non-QC results (including non-standard constituents). Sixteen of these (0.1 percent) were coded 4 (indicating there may be some question about the quality) and 111 (0.8 percent) were coded > 4 (indicating serious quality questions; data will not be routinely used). All but eight of the results in the latter category, however, were from a site that became stagnant during part of the year. Although results coded >4 are not normally used, they can be provided on request. This practice gives us the opportunity to explain quality issues to prospective users. MEL coded 843 results (6 percent) as estimates ("J").

Because the variability of many constituents increases with increasing mean concentration, the RMS values for some constituents are presented according to concentration ranges (Table 8). In practice, the estimates of the variability are strongly influenced by extreme values, especially when sample size is small. The analysis is further complicated because all data below the reporting limit are censored by MEL, effectively producing a variance of zero between any two samples that are below this limit. This skews the variability estimate downward for the lowest concentration ranges.

In general, variability of QC types followed the expected pattern of field sequential samples > field split samples > lab split samples. Nitrate+nitrite nitrogen was a notable exception. Lab splits for all concentration categories had higher RMSs than field splits. This occurred because besides splitting our field splits, MEL splits additional samples as well. When these were excluded from the analysis, lab split RMSs were lower than field split RMSs for all categories.

Variability between paired samples as measured by RMS was quite low and generally similar to that experienced in previous years for all constituents. No constituent categories failed to meet our Quality Assurance Monitoring Plan (QAMP) Data Quality Objectives (DQO) (Hallock and Ehinger, 2003), which specifies that DQOs be evaluated against field splits where possible. Three field sequential constituent categories failed to meet the DQO criteria, but instream variability is included in these sample pairs so their variability is not a true measure of sampling plus analytical error.

The expected results of the analyses of the blank samples were 'below reporting limits' for all concentrations and turbidity, and less than three μS (micro Siemans) for specific conductivity. Temperature, dissolved oxygen, pH, and fecal coliform were not measured on blanks. With one exception, all measurements on blank samples were reported as 'less than the reporting limits' (Table 9). One total nitrogen blank sample was reported as 39 μg/L. The total nitrogen reporting limit changed in March 2002 from 10 to 25 μg/L.

Laboratory staff assessed the remaining elements of the laboratory QA program through a manual review of laboratory quality control results including check standards, in-house matrix spikes, and laboratory blanks. Results were within acceptable ranges as defined by MEL's Quality Assurance Manual (Ecology, 2001) or were either re-run or coded as deemed appropriate by laboratory staff (e.g., as an estimate, "J").

Several quality control issues developed this water year that may affect long-term trend analyses. Three of these are minor, but the first is critically important for total phosphorus trend interpretation. These issues have been added to Appendix B:

- During the course of evaluating a different method for phosphorus analysis, MEL discovered that the current total phosphorus method, which uses in-line digestion, contains a high bias (4 to 20 ppb). This method has been used since about May 2000. We intend to change methods beginning with WY 2004. Trend analyses of total phosphorus data should be interpreted carefully if results collected between May 2000 and September 2003 are included.
- Some barometric pressures collected from the western part of the state prior to July, 2002, may be off by 1.0 mmHg due to calibration errors. The effect of this amount of error on the percent oxygen saturation calculation is insignificant.
- In our database, the units for turbidity results collected prior to January 1976 were changed from NTU to JTU. These units were originally JTU but were changed to NTU for unknown reasons. Though roughly equivalent at JTUs > 25, JTUs and NTUs are not equivalent for lower measurements; the original units should have been retained.
- A number of suspended solids results entered into our database as '0' were deleted. We do not know if these results were below reporting limits or "missing data"; 138 results collected between 1972 and 1981 were affected.

Only one QC result (a calibration check) for temperature monitoring data loggers exceeded the specified limits. Data from the affected air logger were adjusted for bias. Water level changes at a few stations exposed the water temperature logger to air. This problem was readily apparent during a graphical review of the data and affected results were removed prior to loading the data into the database. In one case, beaver logging activities relocated an air temperature logger, however, this did not appear to significantly affect the data.

Table 8. Root mean square of the standard deviation of sequential samples, field splits, and laboratory splits. *n* = number of sample pairs. NA=not applicable. Results exceeding QAMP DQO criteria are shown in bold.

Variable (units)	Range	$s_{error\ (mp)}$ [a]	Field Sequential RMS	*n*	Field Split RMS	*n*	Lab Split RMS	*n*
Electrical conductivity (µS/cm)	≤50 >50-100 >100-150 >150	4.4 8.8 13.2 26.4	0.27 0.69 1.26 3.46	7 16 6 11	No field Split		No lab split	
Fecal col. bacteria (colonies /100 mL)	1-1000 >1000	88 176	24 NA	40 0	No field Split		7.19 NA	148 0
NH_3-N (µg N /L)	≤20 >20-100 >100	1.76 8.8 17.6	1.14 2.78 NA	36 4 0	0.905 2.03 NA	36 4 0	0.50 1.24 NA	77 12 0
Nitrogen, total (µg N/L)	≤100 >100-200 >200-500 >500	8.8 17.6 44 88	**11.2** 7.19 12.0 38	6 10 13 11	6.17 8.47 11.2 14.3	7 9 12 12	3.16 3.90 6.47 67	25 24 26 24
NO_3NO_2-N (µg N /L)	≤100 >100-200 >200-500 >500	8.8 17.6 44 88	0.57 2.56 2.66 11.0	14 7 10 9	0.378 0.577 1.77 9.50	14 6 11 9	0.64 1.08 3.20 12.9	50 17 26 24
Oxygen, dissolved (mg O_2 /L)	≤ 8 > 8-10 > 10-12 >12	0.70 0.88 1.06 2.11	NA 0.192 0.121 0.377	0 5 21 14	NA 0.055 0.081 0.065	0 5 22 13	No lab split	
pH	all	0.66	0.091	39	No field Split		No lab split	
Phosphorus, soluble reactive (µg P L^{-1})	≤50 >50-100 >100	4.4 8.8 17.6	0.69 0.62 NA	33 7 0	0.280 0.924 NA	33 7 0	0.28 0.51 0.71	119 10 2
Phosphorus, total (µg P/L)	≤50 >50-100 >100	4.4 8.8 17.6	1.14 3.01 2.83	26 12 1	1.22 3.08 3.54	26 12 1	1.10 1.71 1.80	86 26 4
Solids, suspended (mg /L)	≤10 >10-20 >20-50 >50	0.88 1.76 4.4 8.8	0.36 1.71 **5.34** **42**	27 8 3 2	No field Split		0.19 0.55 0.98 4.20	54 20 14 11
Temperature (ºC)	N/A	2.64	0.07	39	No field split		No lab split	
Turbidity (NTU)	≤10 >10-20 >20-50 >50	0.88 1.76 4.4 8.8	0.24 **3.54** 2.5 NA	34 4 2 0	0.257 0.707 0 NA	33 5 1 0	0.05 0.18 0.35 1.44	61 16 12 6

[a] Maximum permissible standard error to meet QAMP DQOs (Hallock and Ehinger, 2003).

Table 9. Results of blind blank (deionized water) sample submission.

Variable	reporting limit	# above reporting limit (mean concentration)	sample size, *n*
Specific conductivity (μS)	NA	NA (mean: 1.78, std dev: 0.48)	8
Turbidity (NTU)	0.5	0	8
Suspended solids (mg L^{-1})	1.0	0	2
Total phosphorus (μg L^{-1})	10	0	8
Soluble reactive P (μg L^{-1})	3	0	8
Total Nitrogen (μg L^{-1})	10 and 25	1 (39 μg/L)	8
NO_3/NO_2-N (μg L^{-1})	10	0	8
NH_3-N (μg L^{-1})	10	0	8

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Appendix A

Station description and period of record
for the Ecology River and Stream
Ambient Monitoring Program

Monitoring History for Environmental Assessment Program Ambient Monitoring Stations

Station Number	Name	Long-term or Rotating	Water Year Sampled <---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
01A050	Nooksack R. @ Brennan	L		X XX XX	XXXXXXXXXX	XXXXXXXXXX	XXXX
01A070	Nooksack R @ Ferndale	R	XXXXXXXX	XX X X			
01A090	Nooksack R nr Lynden	R		X X X			
01A100	Nooksack R @ Hannegan Road	R					
01A120	Nooksack R @ No Cedarville	L	X XXXXXXXX X	XX X XX	XXXXXXXXXX	XX X XXXXX	XXXX
01A140	Nooksack R above the MF	R				X	X
01B050	Silver Cr nr Brennan	R				XX	
01C070	Hutchinson Cr. nr Acme	R					
01D070	Sumas R nr Huntingdon BC	R		X X XXX	XXXXXXXXXX	XXX X	
01D080	Sumas R @ Jones Road	R					X
01D090	Sumas R @ Sumas	R		X X			
01D100	Sumas R. @ Telegraph Rd.	R					
01D120	Sumas R nr Nooksack	R				X	
01E050	Whatcom Cr @ Bellingham	R		X X		X	
01E070	Whatcom Cr @ Lake Outlet	R		X			
01E090	Whatcom Lake nr Bellingham	R	XXX X	X			
01F070	SF Nooksack @ Potter Rd	R				X	X
01G070	MF Nooksack R	R				X	X
01G100	M.F. Nooksack abv Clearwater Cr.	R					
01H070	Terrell Cr. nr Jackson Rd.	R					X
01J060	Bar Cr. nr mouth	R					
01K050	Maple Cr. @ mouth	R					
01L050	Anderson Cr. @ mouth	R					
01M090	Kamm Slough @ Northwood Rd.	R					
01N060	Bertrand Cr. nr mouth	R					
01P080	Tenmile Cr. abv Barrett Lake	R					
01Q070	Dakota Cr. @ Giles Rd.	R					
01R090	California Cr. @ Valley View Rd.	R					

Station Number	Name	Long-term or Rotating	Water Year Sampled					
				<---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
01S070	Squalicum Cr. @ West St.	R						
03A050	Skagit R @ Conway	R			X X			
03A060	Skagit R nr Mount Vernon	L	X	XXXXXXXX X	X XXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXX
03A070	Skagit R nr Sedro Woolley	R			X X X			
03A080	Skagit abv Sedro Woolley	R						X
03B045	Samish R. nr Mouth	R					X	X
03B050	Samish R nr Burlington	L	X	XXXXXXXX X	XX X XXX	XXXXXXXXXX	XX X XXXXX	XXXX
03B070	Samish R nr Hoogdal	R			X			
03B080	Samish R. nr Prairie	R					X	
03C060	Friday Cr Blw Hatchery	R			X		X X	
03C080	Friday Cr at Alger	R			X			
03D050	Nookachamp Ck nr Mouth	R					X	X
03E050	Joe Leary Slough nr Mouth	R						X
03F070	Hill Ditch @ Cedardale Rd	R						X
03G100	E.F. Nookachamps Cr. @ Beaver Lk. R	R						
03H090	Mannser Cr. Nr Hamilton	R						
04A060	Skagit R @ Concrete	R			X X XXX	XXXXXXXXXX	XX X	
04A100	Skagit R @ Marblemount	L	X	XXXXXXXX X	X XX	XXXXXXXXXX	XXXXXXXXXX	XXXX
04A140	Skagit R @ Newhalem	R			X X			
04B070	Baker R @ Concrete	R		XXXX	XXX	XXXXXXXXXX	XX X	
04B150	Baker Lake @ Boulder Cr	R			XXXXX	X		
04C070	Sauk R nr Rockport	R			XXX	XXXXXXXXXX	XX X	
04C110	Sauk R @ Darrington	R	X	XX				
04E050	Finney Cr near Birdsview	R					X	
05A050	Stillaguamish R @ Stanwood	R			X			
05A055	Hat Slough nr Stanwood	R			X			
05A070	Stillaguamish R nr Silvana	L	X	XXXXXXXXXX	XX X XXX	XXXXXXXXXX	XXXXXXXXXX	XXXX
05A090	SF Stillaguamish @ Arlington	L			X X XX	XXXXXXXXXX	XX X XXXXX	XXXX
05A100	S.F. Stillaguamish R. @ River Mdws	R						

Station Number	Name	Long-term or Rotating	Water Year Sampled					
				<---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
05A110	SF Stillaguamish nr Granite Falls	L	X	XXXXXXX	X		X XXXXX	XXXX
05A150	S.F. Stillaguamish R. @ Verlot	R						
05B070	NF Stillaguamish @ Cicero	L		XXXXXXXX	XX X XX	XXXXXXXXXX	XX X XXXXX	XXXX
05B080	N.F. Stillaguamish R. abv Deer Cr.	R						
05B090	NF Stillaguamish R @ Oso	R			X			
05B110	NF Stillaguamish nr Darrington	L			X		X XXXXX	XXXX
05B200	N.F. Stillaguamish R abv Crevice Cr	R						
05C070	Deer Cr. @ Oso	R						
05D070	Pilchuck Cr. @ Bridge 626	R						
05E060	Armstrong Cr. nr Arlington	R						
07A090	Snohomish R @ Snohomish	L	X	XXXXXXXX X	XX X XXX	XXXXXXXXXX	XXXXXXXXXX	XXXX
07A109	Snohomish R nr Monroe NE	R			X			
07A110	Snohomish R nr Monroe SW	R			X			
07A111	Snohomish R nr Monroe (USGS)	R			XX X	XX		
07B055	Pilchuck R @ Snohomish	R			X X XX	XXXXXXXXXX	XXX X	
07B090	Pilchuck R nr Lake Stevens	R			X			
07C070	Skykomish R @ Monroe	L			X X XXX	XXXXXXXXXX	XXXX XXXXX	XXXX
07C090	Skykomish R @ Sultan	R			X X			
07C120	Skykomish R nr Gold Bar	R	X	XXXXXXXXXX	X XX	XXXXXXXXXX	XXX	X
07C170	Skykomish R nr Miller R	R			X			
07D050	Snoqualmie R nr Monroe	L			X		XX XXXXX	XXXX
07D070	Snoqualmie R nr Carnation	R			X XX XXX	XXXXXXXXXX	XXX X	
07D100	Snoqualmie R. abv Carnation	R						X
07D130	Snoqualmie R @ Snoqualmie	L	X	XXXXXXXXXX	X XXX	XXXXXXXXXX	XXX XXXXX	XXXX
07D150	M F Snoqualmie R nr Ellisville	R					X	X
07E055	Sultan R @ Sultan	R		XXXXXXXX X	XX X		X	X
07F055	Woods Cr @ Monroe	R			X X		X X	
07G070	Tolt R nr Carnation	R		XXXXXXXXXX	X		X	
07M070	S F Snoqualmie R at North Bend	R					X	

Station Number	Name	Long-term or Rotating	Water Year Sampled				
			<---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
07N070	N F Snoqualmie R near Ellisville	R				X	
07P070	Patterson Ck nr Fall City	R				X X	
07Q070	Raging R @ Fall City	R				X	X
07R050	French Cr nr Mouth	R				X	
08A070	McAleer Cr nr Mouth	R		X			
08A090	Upper McAleer Cr	R		X			
08B070	Sammamish R @ Bothell	R	X XXXXXXXXXX	XX X X XX	XXXXXXXXXX	XXXXX X	
08B110	Sammamish R @ Redmond	R		X		X	
08B130	Issaquah Cr nr Issaquah	R	XXX X	XX X X		X	
08C070	Cedar R @ Logan St/Renton	L	X XXXXXXX	X X X XX	XXXXXXXXXX	XXXXXXXXXX	XXXX
08C080	Cedar R @ Maplewood	R				X	
08C090	Cedar R @ Maple Valley	R		X		X	
08C110	Cedar R nr Landsburg	L	X XXX	X XX	XXXXXXXXXX	XX XXXXXX	XXXX
08D070	Mercer Slough nr Bellevue	R		X			
08E090	Kelsey Cr @ Monitor Site	R		X			
08E110	Upper Kelsey Cr	R		X			
08F070	May Cr nr Mouth	R		X			
08G070	Valley Cr nr Mouth	R		X			
08H070	Thornton Cr nr Mouth	R		X			
08H100	North Branch Thornton Cr	R		X			
08J070	West Branch Thornton Cr	R		X			
08J100	Swamp Creek abv Lynnwood	R					X
08K070	Ship Canal @ Ballard	R					
08K071	Bear Cr. below Cottage Lake Cr.	R					
08K090	Ship Canal @ Freemont	R				X	
08K100	North Creek nr Everett	R					X
08K110	Ship Canal @ University	R					
08K130	Ship Canal @ Montlake	R					
09A060	Duwamish R @ Allentown Br	R			XXXXXXXXXX	XX	

Station Number	Name	Long-term or Rotating	Water Year Sampled <---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
09A070	Duwamish R @ Foster	R	X XXXXXXXX				
09A080	Green R @ Tukwila	L				XXXXXXXXX	XXXX
09A090	Green R @ 212th St nr Kent	R		X XX	XXXXXXXXXX	XX X	
09A110	Green R @ Auburn	R	XXXXX X	XX			
09A130	Green Abv Big Soos/Auburn	R	X XXXXXXXXX	X		X	
09A150	Green R nr Auburn	R		X			
09A170	Green R nr Black Diamond	R		X			
09A190	Green R @ Kanaskat	L	X XX	X XX	XXXXXXXXX	XXXXXXXXX	XXXX
09B070	Big Soos Cr blw Hatchery	R		X X			
09B090	Big Soos Cr nr Auburn	R	XXXX	XX		X X	
09C070	Des Moines Cr nr Mouth	R		X		X	
09C090	Des Moines Cr @ So 200th	R		X			
09D070	Miller Cr nr Mouth	R		X			
09D090	Miller Cr @ Ambaum Blvd SW	R		X			
09E070	Mill Creek @ Orillia	R			XXXXXX	X X	
09E090	Mill Creek - Kent on W Valley Hwy	R			XXXXXX	X	
09F071	Newaukum Cr nr Mouth	R					
09F150	Newaukum Creek nr Enumclaw	R				X	
09G071	Springbrook Cr. @ N. end Longacres	R					
09H090	Black R @ Renton	R				X	
10A050	Puyallup R @ Puyallup	R	X XXXXXXXX X	XXX XXXXX	XXX		XXX
10A070	Puyallup R @ Meridian St	L		X X XX	XXXXXXXXX	XXXXXXXXX	XXXX
10A090	Puyallup R @ McMillin	R		X X			
10A110	Puyallup R @ Orting	R	X XXX XXXXXX	XXX X XX	XXXXXXXXX	XX X X	
10B070	Carbon R nr Orting	R	XX	XX		X	
10B090	Carbon R @ Fairfax	R		X			
10C070	White R @ Sumner	R		XX XX	XXXXXXXXX	XX X X	
10C085	White R nr Sumner	R	X	X X		X	
10C090	White R @ Auburn	R	XXXXX	X X			

Station Number	Name	Long-term or Rotating	Water Year Sampled				
			<---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
10C091	White R @ Auburn - A	R					
10C095	White River @ R Street	R				X	XXXX
10C110	White R blw Buckley	R		X			
10C115	White River nr 274th Ave.	R					
10C130	White R @ Buckley	R				X	
10C135	White R. abv Raineer School WWTP	R					
10C140	White R nr Buckley	R		X			
10C150	White R nr Greenwater	R		X			
10D070	Boise Cr @ Buckley	R	XXX	X			X
10D090	Boise Cr nr Enumclaw	R	XXX				
10E050	Salmon Creek nr Mouth	R					
10E070	Salmon Cr @ Sumner	R		X			
10F070	So Prairie Cr nr Crocker	R		X			
10F090	South Prairie Ck nr S. Prairie	R				X	
10F110	South Prairie Cr. @ South Prairie	R					
10F150	South Prairie Cr. @ Burnette	R					
10G060	Hylebos Creek at Mouth	R					
11A070	Nisqually R @ Nisqually	L		X	X XX	XXXXXXXXXX	XXXXXXXXXX XXXX
11A080	Nisqually R @ McKenna	R	X XXXXXXXXXX	X			XX X
11A090	Nisqually R abv Powell Cr	R		X	XX	XXXXXXXXXX	X
11A110	Nisqually R @ LaGrande	R		X			
11A140	Nisqually R @ Elbe	R		X	X XX	X	
12A070	Chambers Cr nr Steilacoom	R	XXXXX	XX	X	XXXXXX	XX X X
12A100	Chambers Cr blw Steilacoom Lk	R	XX		X		XXX
12A110	Clover Cr abv Steilacoom Lk	R	XXX		X		XXXX
12A130	Clover Cr nr Parkland	R	XX				
12A140	Clover Creek nr Waller Road	R					
12B070	Leach Cr nr Steilacoom	R	XXX		X		
12C070	Flett Cr @ Custer Rd	R	XXX		X		

Station Number	Name	Long-term or Rotating	Water Year Sampled				
			<---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
12D050	Ponce de Leon Ck nr mouth	R				XXX	
13A050	Deschutes R @ Tumwater	R	XXXXX X	X X			
13A060	Deschutes R @ E St Bridge	L		XX	XXXXXXXXXX	XXXX XXXXX	XXXX
13A080	Deschutes R nr Olympia	R		X X X			
13A150	Deschutes R nr Rainier	R	X XXX	X X XX	XXXXXXXXXX	XX X	
13B170	Woodland Cr. nr Lacey	R					
14A060	Goldsborough Cr @ Shelton	R				X X	
14A070	Goldsborough Cr nr Shelton	R	XXX X	X			
15A070	Dewatto R nr Dewatto	R		XXX		X	
15B050	Chico Cr nr Chico	R				X	
15B070	Chico Cr nr Bremerton	R	XXXXX	X			
15C070	Clear Cr @ Silverdale	R				X	
15D090	Tahuya R nr Belfair	R				X	
15E070	Union R nr Belfair	R				X	X
15F150	Big Beef Cr. @ Holly Rd.	R					
15G050	Little Mission Cr. @ Hwy 300	R					X
15H050	Stimpson Creek @ Hwy 300	R					X
15J050	Big Mission Cr. @ Hwy 300	R					X
15K070	Olalla Cr. @ Forsman Rd.	R					X
16A070	Skokomish R nr Potlatch	L	XXXXXXXX X	X XXX XX	X XXXXXX	XXXXXXXXXX	XXXX
16B070	Hamma Hamma R nr Mouth	R	XXXXXX X	X X			
16B110	Hamma Hamma R nr Eldon	R		XX		X	
16B120	Hamma Hamma R above Cabin Creek	R					
16C070	Duckabush R @ Mouth	R	XXXXXXXX X	X X			
16C090	Duckabush R nr Brinnon	L		XXX		XXXXXX	XXXX
16D070	Dosewallips R @ Brinnon	R	X XXXXXXXXXX	X XXX		X	
16E070	Finch Cr @ Hoodsport	R				X X	
17A060	Big Quilcene R nr mouth	R					XX
17A070	Big Quilcene R nr Quilcene	R	X XXXXXXX	XXX		X X	

Station Number	Name	Long-term or Rotating	Water Year Sampled <---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
17B050	Chimacum Cr. @ mouth	R					
17B070	Chimacum Cr nr Irondale	R				X	
17B090	Chimacum Cr @ Hadlock	R		X			
17B100	Chimacum Cr @ Chimacum	R				X	
17B110	Chimacum Cr nr Chimacum	R		X			
17C070	Jimmycomelately Cr near Mouth	R					XX
17D060	Little Quilcene R. nr mouth	R					
17E060	Snow Cr. @ WDFW	R					
17F060	Salmon Cr. @ West Uncas Rd.	R					
17G060	Tarboo Cr. nr mouth	R					
17H060	Thorndyke Cr. nr mouth	R					
17J050	Pheasant Cr. @ mouth	R					
18A050	Dungeness R nr Mouth	R					XXX
18A070	Dungeness R nr Sequim	R	X XXXXXXX	XXX		X X	XX
18B070	Elwha R nr Port Angeles	L	X XXXXXXX X	XXX		XXXXXX	XXXX
18B080	Elwha R @ McDonald Br (USGS)	R		XXXXX	XX		
18C070	Morse Cr. @ Four Seasons Ranch	R					
18C150	Morse Cr. blw Aqueduct	R					
18D060	Matriotti Cr. @ Olympic Game Farm	R					
18E100	Meadowbrook Cr. nr Dungeness	R					
18F250	Agnew Irrigation Dt. nr Sequim	R					
18G250	CCD Irrigation Dt. nr Sequim	R					
18H250	Sequim/Prairie Irrig. Dt. nr Sequim	R					
18J250	Highland Irrigation Dt. nr Sequim	R					
18K250	Independent Irrig. Dt. nr Sequim	R					
18L060	Seibert Cr. @ Old Olympic Hwy.	R					
18M060	Ennis Cr. nr mouth	R					
18N050	Little R. @ mouth	R					
18P070	McDonald Cr. @ Hwy 101	R					

Station Number	Name	Long-term or Rotating	Water Year Sampled				
			<---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
18Q050	Indian Cr. @ mouth	R					
18Q200	Indian Cr. nr Maple Grove	R					
18Q240	Indian Cr. blw Lake Sutherland	R					
19A070	Pysht R nr Pysht	R		XXX			
19B070	Hoko R nr Mouth	R		X			
19B090	Hoko R nr Sekiu	R		XX			
20A090	Soleduck R nr Forks	R		XXX		X	
20A130	Soleduck R nr Fairholm	R	XXXXXXXX X	X			
20B070	Hoh R @ DNR Campground	L	XXXXXXXXXX	X XXX XX	X	XXXXXX	XXXX
20C070	Ozette R @ Ozette	R	X XX				
20D070	Dickey R nr La Push	R				X	
21A070	Queets R @ Queets	R	XXXXXXXXXX	X X		X	
21A080	Queets R nr Clearwater (USGS)	R		XX	XX		
21A090	Queets R abv Clearwater	R		XX			
21B090	Quinault R @ Lake Quinault	R	X X XXXXXX	X XXX XX	X	X	
21C070	Clearwater R nr Queets	R		XX			
21D070	NF Quinault R @ Amanda	R		XXXXXXXXX	XX		
22A070	Humptulips R nr Humptulips	L	X XXXXXXXXX	X XXX XX	XXXXXXXXXX	XXXXXXXXXX	XXXX
22B070	WF Hoquiam R nr Hoquiam	R	XXXXX	XX		X	
22C050	Chehalis R nr Montesano	R		XX XX	XXXXXXXXXX	XXX	
22C070	Chehalis R nr Fuller	R		X X			
22D070	Wishkah R nr Wishkah	R	XXXXX	XX X			
22F090	Wynoochee R nr Montesano	R	X XXXXXXXX X	X XX X			
22G070	Satsop R nr Satsop	R	XXXXXXXXXX	XX X XXX	XXXXXXXXXX	XX X	
22H070	Cloquallum Cr nr Elma	R	XXXX	X X X			
22J070	Wildcat Cr nr McCleary	R		X			
22K070	Bingham Cr. @ Hatchery	R					
23A070	Chehalis R @ Porter	L	X XXXXXXXXX	XXXX XXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXX
23A100	Chehalis R @ Prather Rd	R				XXX	XX

Station Number	Name	Long-term or Rotating	Water Year Sampled				
			<---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
23A110	Chehalis R @ Galvin	R		X X X			
23A120	Chehalis R @ Centralia	R		XX	XXXXXXXXXX	XX X	
23A130	Chehalis R @ Claquato	R				X	
23A140	Chehalis R @ Adna	R		X X X			
23A160	Chehalis R @ Dryad	L	X XXXXXXX	XX	XXXXXXXXXX	XXXXXXXXXX	XXXX
23B050	Newaukum @ Mouth	R				X	
23B070	Newaukum R nr Chehalis	R	XXXXXXXX	X X X		X	
23B090	SF Newaukum R @ Forest	R		X			
23C070	NF Newaukum R @ Forest	R		X			
23D055	Skookumchuck R @ Centralia	R				X X	
23D060	Skookumchuck R nr Frost Prairie	R					
23D070	Skookumchuck R nr Centralia	R	X X				
23E070	Black River @ Moon Road Bridge	R				XX X XXX	
23F070	Mill Ck nr Bordeaux	R				X	
23G070	SF Chehalis R @ Curtis	R				X	
24B090	Willapa R nr Willapa	L	XX X	XXXXX XXXX	XX XXXXXX	XXX XXXXX	XXXX
24B100	Willapa R. @ Oxbow	R					
24B130	Willapa R @ Lebam	R	X XX X	XX	XXXXXXXXXX	XXX	
24C060	SF Willapa R @ Fuller St	R					
24C065	S.F. Willapa R. @ South Fork WTP	R					
24C070	SF Willapa R @ South Bend	R		X			
24D070	North R nr Raymond	R		X XX		XX	
24D090	North R @ Artic	R				X	
24E070	North Nemah R @ Nemah	R		X X			
24F040	Naselle R @ Mouth	R		X			
24F055	Naselle R @ Naselle	R		X			
24F070	Naselle R nr Naselle	L	XX X	X X XXXX	X	X XXXXX	XXXX
24G070	Bear Branch nr Naselle	R	X	X			
24H070	Middle Nemah R nr Nemah	R		X			

Station Number	Name	Long-term or Rotating	Water Year Sampled				
			<---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
24J070	South Namah R nr Nemah	R		X			
24K060	Forks Cr. @ Willapa Hatchery	R					
24L060	Canon R. @ Kleeb's Trail	R					
24L090	Canon R. @ A-Line Bridge	R					
25A070	Columbia R @ Cathlamet	R	XX	X X			
25A075	Columbia R @ Bradwood	R		XXXXXX			
25A110	Columbia R @ Fisher Is Lt	R	XXXXX				
25A115	Columbia R nr Longview	R	XX	X X			
25A150	Columbia R blw Longview Br	R	X	X			
25B070	Grays R nr Grays River	R		X XX		X	
25C070	Elochoman R nr Cathlamet	R	X	X XX		X	
26B070	Cowlitz R @ Kelso	L	XXXXXXX	XX X XX	XXXXXXXXX	XXXXXXXXXX	XXXX
26B100	Cowlitz R @ Castle Rock	R	XXX	X XXXX			
26B150	Cowlitz R @ Toledo	R	XXXXX	X X XX	X	X	
26B180	Cowlitz nr Kosmos B Cispus	R	X XXXXXXXX				
26B190	Cowlitz R nr Randle	R	X	X X X			
26B200	Cowlitz R nr Kosmos	R		X			
26C070	Coweeman R @ Kelso	R	XXXXX	XX X	XXXXXX	XXX X	
26C080	Coweeman R av Goble Cr	R				X	
26C090	Coweeman R nr Rose Valley	R		X X			
26D070	Toutle R nr Castle Rock	R	XXXXXXXX X	X X X XX	XXXXXXXXX	XXX	
26D090	Toutle R @ Tower Rd	R					
26E070	Cispus R nr Kosmos	R		X	XXX		
27A070	Columbia R @ Kalama	R	XX	X XX			
27A110	Columbia River nr St. Helens	R	XX	X			
27B050	Kalama R @ Kalama	R	XXXXXXXXX	X			
27B070	Kalama R nr Kalama	L		XX XX	XXXXXXXXX	XXX XXXXX	XXXX
27B080	Kalama R blw Upper Hatchery	R					
27B090	Kalama R @ Upper Hatchery	R		X			

Station Number	Name	Long-term or Rotating	Water Year Sampled <---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
27B110	Kalama R @ Pigeon Springs	R		X			
27C070	Lewis R @ Woodland @ I-5	R	XXXXX X	X XX			
27C080	Lewis R @ Co Rd 16	R				X	
27C110	Lewis R @ Ariel	R	X X	XXX	X		
27D090	EF Lewis R nr Dollar Corner	L		XXX	XXXXXXXXXX	XXX XXXXX	XXXX
27D100	EF Lewis R @ Heisson	R					
27D110	EF Lewis nr Heisson	R					
27E070	Cedar Cr nr Etna	R				X	
27E100	Cedar Cr. @ Grist Mill Bridge	R					
27F070	Gee Cr @ Ridgefield	R				X	
28A090	Columbia blw Vancouver WA	R	XX	X			
28A091	Columbia blw Vancouver OR	R	XX	X			
28A100	Columbia R. @ Vancouver	R					X
28A165	Columbia R @ Warrendale	R		XXXXXXX			
28A170	Columbia R blw Bonneville	R	XX	X			
28A175	Columbia R @ Bonneville Dam	R	XX	X X			
28B070	Washougal R @ Washougal	R	X	X XX XX		X	
28B090	Washougal R nr Washougal	R	XXXXXXXX	X			
28B110	Washougal R blw Canyon Ck	R				X X	X
28C070	Burnt Br Cr @ Mouth	R		X			
28C110	Burnt Br Cr @ Vancouver	R		X			
28D070	Salmon Cr @ Salmon Creek	R		X			
28D110	Salmon Cr nr Battle Ground	R		X			
28E070	Weaver Cr nr Battle Ground	R		X			
28F070	Lake R nr Ridgefield	R				X	
28G070	Gibbons Ck nr Washougal	R				X	X
28H070	Campen Cr. nr Washougal	R					X
29B070	White Salmon R nr Underwood	R	XXXXXXXXXX	X XX XXXX	XXXX	X	
29C070	Wind R nr Carson	R		X XXXX	XXXX	X	

Station Number	Name	Long-term or Rotating	Water Year Sampled				
			<---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
29D070	Rattlesnake Cr nr Mouth	R				XXX	
29E070	Gilmer Cr nr Mouth	R				XXX	
30A070	Columbia R @ The Dalles	R	XX	XXXXXXXX		X	
30A090	Columbia R @ The Dalles Dam	R	X				
30A100	Columbia R nr Maryhill	R					
30B060	Klickitat R nr Lyle	R				XX	
30B070	Klickitat R nr Pitt	R	XXX	X XXXXXXX	X		
30C070	Little Klickitat nr Wahkiacus	R		X		XX	
30C090	Little Klickitat R. @ Olson Rd.	R					
30C150	Little Klickitat R. @ Hwy 97	R					
31A070	Columbia R @ Umatilla	L	X	XXXXX		XXXXXXXXX	XXXX
31A090	Columbia R @ McNary Dam	R	X XXXXXXXXXX				
31A130	Columbia R nr Yakima R Mouth	R	X				
32A070	Walla Walla R nr Touchet	L	X XXXXXXX	XX XXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXX
32A090	Walla Walla R nr Lowden	R		XX			
32A100	Walla Walla at east Detour Road Br	R				X	X
32A105	Walla Walla R. @ Beet Rd.	R					
32A110	Walla Walla R @ College Pl	R		XX XX			
32A120	Walla Walla R. @ Pepper Bridge	R					
32B070	Touchet R @ Touchet	R		X XX XX	XXXXXXXXXX	XXX X	
32B075	Touchet R. @ Cummins Rd.	R					X
32B080	Touchet at Sims Road	R				X	X
32B090	Touchet R nr Luckenbill Rd	R					
32B100	Touchet R @ Bolles	R		XX		X	X
32B110	Touchet R. @ County Line	R					
32B120	Touchet R nr Dayton	R		XX			
32B130	Touchet R @ Dayton	R	X X			XX	
32B140	Touchet R above Dayton	R				X	
32C070	Mill Cr @ Swegle Rd	R		X XX			X

Station Number	Name	Long-term or Rotating	Water Year Sampled				
			<---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
32C110	Mill Cr @ Tausick Way	R		X X		X	
32D050	Yellowhawk Cr nr mouth	R					
32E050	N.F. Touchet R. abv Dayton	R					
32E150	N.F. Touchet R. abv Jim Cr.	R					
32F060	Dry Cr. nr mouth	R					
32F150	Dry Cr. @ Hwy 125	R					
32G060	Coppei Cr. nr mouth	R					
32H090	E.P. Ltl Walla Walla R. @ Stateline	R					
32J070	Robinson Fork abv W.F. Touchet	R					
32K070	Wolf Fk Touchet R. @ Mtn. Home Park	R					
32L070	S.F. Touchet R. abv Dayton	R					
33A010	Snake R nr Mouth	R	X				
33A050	Snake R nr Pasco	L	XXXXXXX X	X		XXXXXXXXX	XXXX
33A05X	Snake R @ Burbank	R					
33A070	Snake R blw Ice Harbor Dam	R	X	X XXXXXX	XXXXXXXXXX	XX	
33A100	Snake R blw Lower Monumental Dam	R					
34A070	Palouse R @ Hooper	L	X XXXXXXXXXX	X XXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXX
34A085	Palouse R @ Shields Rd Bridge	R				X	
34A090	Palouse R nr Diamond	R		X X			
34A110	Palouse R abv Buck Canyon	R		X XX			
34A120	Palouse R at Colfax	R					X
34A170	Palouse R @ Palouse	L		X		XXXXXXXX	XXXX
34B070	SF Palouse R nr Colfax	R		X XX			
34B085	SF Palouse R at Armstrong Rd	R					
34B090	SF Palouse R nr Pullman	R		X X			
34B110	SF Palouse R @ Pullman	L		X X XX	XXXXXXXXXX	XXX XXXXX	XXXX
34B130	SF Palouse R blw Sunshine	R		X			
34B140	SF Palouse R @ Busby	R				X	
34B150	SF Palouse R nr Moscow ID	R					

Station Number	Name	Long-term or Rotating	Water Year Sampled <---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
34C060	Paradise Cr at Mouth	R				X	
34C070	Paradise Cr nr Pullman	R		X			
34C100	Paradise Cr @ Border	R				X	
34D070	SF Palouse Trib Whitman Fm	R		X			
34E070	Rock Creek at Revere	R				X	
34E100	Rock Creek at Escures Property	R					
34F070	Missouri Flat Creek @ Pullman	R					
34F090	Pine Cr @ Rosalia	R				X	
34G070	Snake R @ Lyons Ferry	R					
34H070	Pleasant Valley Cr blw St John	R					X
35A070	Snake R @ Central Ferry	R					
35A100	Snake R blw Lwr Granite Dam	R		X			
35A110	Snake R at Lwr Granite Dam	R					
35A150	Snake R @ Interstate Br	L	XXXXX XX			XXXXXXXXX	XXXX
35A200	Snake R nr Anatone	R		XXXXXXXX			
35B060	Tucannon R @ Powers	L		X XX	XXXXXXXXXX	XXX XXXXX	XXXX
35B090	Tucannon R @ Smith Hollow	R					
35B100	Tucannon R @ Territorial Road	R					
35B110	Tucannon R nr Delaney	R	X X				
35B120	Tucannon R @ Brines Road	R					
35B150	Tucannon R nr Marengo	R				X	
35C070	Grande Ronde R nr Anatone	R		X	XXX	X	
35D070	Asotin Cr @ Asotin	R		X		X X	X
35E070	Clearwater R @ US12/95	R				X	
35F050	Pataha Cr near mouth	R					
35F070	Pataha Cr @ Archer Rd	R				X	
35F095	Pataha Cr @ Tatman Road	R					
35F110	Pataha Cr @ Rosy Grade	R					X
35G060	Joseph Cr. nr mouth	R					

Station Number	Name	Long-term or Rotating	Water Year Sampled				
			<---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
35K050	Alpowa Cr. @ mouth	R					
35L050	Almota Cr. @ mouth	R					
35M060	Deadman Cr. nr mouth	R					
35M100	Deadman Cr. nr Gould City	R					
36A055	Columbia R @ Port of Pasco	R		X			
36A060	Columbia R @ Pasco	R	XX				
36A065	Columbia R @ Richland	R		X			
36A070	Columbia R nr Vernita	L	XX XX	X X XXX XX	XXXXXXXXXX	XX XXXXXX	XXXX
37A040	Yakima R @ I-182	R					
37A060	Yakima R @ VanGiesen Br	R		X XX			
37A070	Yakima R nr Richland	R		X			
37A090	Yakima R @ Kiona	L	X XXX XXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXX
37A095	Yakima 2 mi blw Prosser	R				X	
37A100	Yakima below Prosser	R				X	
37A110	Yakima R @ Prosser	R		X XX			
37A130	Yakima R @ Mabton	R		X XX		X	
37A149	Yakima R @ Granger No Side	R		X			
37A150	Yakima R @ Granger So Side	R		X			
37A152	Yakima above Granger Drain	R					
37A170	Yakima R nr Toppenish	R		X XX		X	
37A190	Yakima R @ Parker	R		X XXXXXXX	XXXXXXXXXX	XXX	
37A200	Yakima R abv Ahtanum Cr (USGS)	R		XX X	XX		
37A205	Yakima R @ Nob Hill	L				XXXXX	XXXX
37A210	Yakima R nr Terrace Height	R		XX XX		X	
37B060	Satus Cr @ Satus	R		XX			
37C060	Toppenish Cr nr Satus	R		XX			
37D080	Marion Drin nr Granger	R		XX			
37E070	Wide Hollow Cr @ Union Gap	R		X X		X	
37E090	Wide Hollow Cr @ Goodman	R		X X			

Station Number	Name	Long-term or Rotating	Water Year Sampled <---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
37E120	Wide Hollow Creek @ Randall Park	R					XX
37F070	Sulfur Ck Wasteway @ McGee Rd	R				X	
37G120	Ahtanum Cr. @ 62nd Ave	R					XX
38A050	Naches R @ Yakima on US HWY 97	R	XXXXXXX			X XX	X X
38A061	Naches River @ Nelson Bridge	R					
38A070	Naches R @ Yakima	R		X X			
38A110	Naches R @ Naches	R	X X	X			
38A130	Naches R nr Naches	R	XXXX				
38B070	Tieton R @ Oak Creek	R	XXXX			X	
38C070	Rattlesnake Cr nr Nile	R	XX				
38D070	Bumping R @ American R	R	XX				
38E070	American R @ American R	R	XX				
38F070	Little Naches nr Cliffdell	R	XXX			X	
38G120	Cowiche Cr. @ Zimmerman rd	R					XX
39A041	Yakima River below Roza Dam	R					
39A050	Yakima R @ Harrison Bridge	R				XX	XXX
39A051	Yakima River @ Umtanum	R					
39A060	Yakima R @ Ellensburg	R				XX	XX
39A070	Yakima R nr Thorp	R		X X			
39A080	Yakima R @ Cle Elum	R	X XXXXXXXXXX	X			
39A090	Yakima R nr Cle Elum	L		X X		XXX XXXXX	XXXX
39B070	Cle Elum R nr Cle Elum	R		X X			
39B090	Cle Elum R nr Roslyn	R				X	
39C070	Wilson Cr @ Thrall	R	XXXX	X X X		X	
39D070	Teanaway R nr Cle Elum	R	XXXXX			X	
39D090	Teanaway R at Highway 970	R					
39E071	Cabin Creek nr Easton	R					
39F050	Wenas Cr. nr Selah	R					
39G060	Naneum Cr. nr Ellensburg	R					

Station Number	Name	Long-term or Rotating	Water Year Sampled				
			<---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
39H050	Sorenson Cr. nr Ellensburg	R					
39J050	Manastash Cr. nr Ellensburg	R					
39K050	Reecer Cr. nr Ellensburg	R					
39L050	Packwood Dt. nr Ellensburg	R					
39M050	Swauk Cr. Nr Cle Elum	R					
39N050	Crystal Cr. Nr Cle Elum	R					
41A070	Crab Cr nr Beverly	L	X XXXXXXXXXX	XXX XX XX	XXXXXXXXXX	XX XXXXXX	XXXX
41A075	Crab Cr nr Smyrna	R	XXX				
41A090	Crab Cr nr Othello	R		X			
41A101	Crab Creek @ McMannon Road	R					
41A110	Crab Cr nr Moses Lake	R	X		XXXX	X X	X
41B071	Winchester Wasteway @ Gage	R					
41C071	Frenchman Hills Wasteway @ Gage	R					
41D070	Rocky Ford Creek @ Hwy 17	R				X	X
41E070	Sand Hollow Creek on Hwy 26	R				X	
41F100	Rocky Ford Coulee Drain	R				X	
41G070	Rocky Coulee Wasteway @ K NE Road	R					X
41H050	Moses Lake S. Outlet	R					X
41J070	Lind Coulee @ Hwy 17	R					X
42A070	Crab Cr below Adrian	R					X
43A070	Crab Cr @ Irby	R	X			X	
43A080	Crab Creek @ Odessa	R					
43A095	Crab Creek @ Amnen Road	R					
43A100	Crab Ck @ Marcelus Road	R				X	
43A110	Crab Creek at Tokio Road	R					
43A130	Crab Creek @ US23	R					
43A150	Crab Ck @ Bluestem Road	R				X	
43B090	Lake Ck @ Coffeepot Road	R				X	
43C070	Goose Creek nr Wilbur	R					X

Station Number	Name	Long-term or Rotating	Water Year Sampled				
			<---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
44A070	Columbia R blw Rock Is Dam	R		X XX XX	XXXXXXXXXX	XX	
45A070	Wenatchee R @ Wenatchee	L	XXXXXXXX X	X X XX XX	XXXXXXXXXX	XXXXXXXXXX	XXXX
45A085	Wenatchee R nr Dryden	R		X			
45A100	Wenatchee R @ Leavenworth	R		X			
45A110	Wenatchee R nr Leavenworth	L	X XXXXXXXX	XX	XXXXXXXXXX	XXXXXXXXXX	XXXX
45A240	Wenatchee R. blw Lake Wenatchee	R					
45B050	Icicle Cr. nr mouth	R					
45B070	Icicle Cr nr Leavenworth	R		X		X	
45C070	Chumstick Cr nr Leavenworth	R				XXX	X X
45D070	Brender Cr nr Cashmere	R				XXX	X X
45E070	Mission Cr nr Cashmere	R				XXX	X X
45F070	Peshastin Cr. @ Green Bridge Rd.	R					
45G060	Chiwaukum Cr. nr mouth	R					
45H060	Chiwawa R. @ Schugart Flat	R					
45J070	Nason Cr. nr mouth	R					
45K070	White R. nr mouth	R					
45K090	White R. nr Plain	R					
45L070	Little Wenatchee R. nr mouth	R					
45L110	Little Wenatchee R. blw Rainey Cr.	R					
45M060	Rainey Cr. nr mouth	R					
45N060	Rock Cr. nr mouth	R					
45P050	White Pine Cr. @ mouth	R					
45Q060	Eagle Cr. nr mouth	R					X
45R050	Noname Creek nr Cashmere	R					X
46A070	Entiat R nr Entiat	L	X XXXXXXX	X XX XX	XXXXXXXXXX	XX XXXXXX	XXXX
46A110	Entiat R. @ Dill Creek Bridge	R					
46A150	Entiat R. @ Tommy Creek Bridge	R					
46A160	Entiat R. blw Entiat Falls	R					
46A170	Entiat R. @ North Fork Campground	R					

Station Number	Name	Long-term or Rotating	Water Year Sampled					
			<---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->	
46B060	Roaring Cr. nr mouth	R						
46C100	Mad R. abv Camp Nine	R						
46D050	Tillicum Cr. @ mouth	R						
46E070	Mud Cr. @ Bisping Canyon Rd.	R						
46F060	Potato Cr. nr mouth	R						
46G060	Stormy Cr. nr mouth	R						
46H050	Preston Cr. @ mouth	R						
46J080	Tommy Cr. Blw USFS Quarry	R						
46K050	Lake Cr. @ mouth	R						
46L050	Pope Cr. @ mouth	R						
47A070	Chelan R @ Chelan	R	XXXXXXXX X	X X XX XX	XXXXXXXXXX	XX X		
47B070	Columbia R @ Chelan Station	R				X X		
48A070	Methow R nr Pateros	L	X XXXXXXX	X XX XX	XXXXXXXXXX	XXXXXXXXXX	XXXX	
48A130	Methow R nr Twisp	R		X XX	XXXXXXXXX			
48A140	Methow R @ Twisp	L			X	XX X XXXXX	XXXX	
48A170	Methow R @ Weeman Br	R		X				
48A190	Methow R blw Gate Cr	R		X XX	X			
48B070	Chewack R @ Winthrop	R		X				
48C070	Andrews Cr nr Mazama	R		XXXXXXXX	XX			
49A050	Okanogan R nr Brewster	R	X XXXXXXX X	X				
49A070	Okanogan R @ Malott	L	XXX	X X XX XX	XX XXXXXX	XXXXXXXXXX	XXXX	
49A090	Okanogan R @ Okanogan	R		X XX	XXXXXXXXX	X		
49A170	Okanogan R @ Janis	R		X				
49A180	Okanogan R @ Tonaskat	R				X		
49A190	Okanogan R @ Oroville	L	XXXXXXX	XX XX	XXXXXXXXXX	XX X XXXXX	XXXX	
49B070	Similkameen R @ Oroville	L	XXXXXXX	XX XX	XXXXXXXXXX	XXXXXXXXXX	XXXX	
49B090	Similkameen R @ Nighthawk	R				X		
49B110	Similkameen R. @ Chopaka Br. B. C.	R					XX	
49C100	Omak Cr. nr St. Mary's Mission	R						

Station Number	Name	Long-term or Rotating	Water Year Sampled <---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
49D080	Johnson Cr. @ Riverside	R					
49E080	Tunk Cr. nr Riverside	R					
49F070	Bonaparte Cr. @ Tonasket	R					
49F150	Bonaparte Cr. @ Aeneas Valley Rd.	R					
49G060	Antoine Cr. nr mouth	R					
49H080	Tonasket Cr. nr Oroville	R					
49J060	Ninemile Cr. nr Oroville	R					
49K090	Toats Coulee Cr. nr Loomis	R					
49L100	Sinlahekin Cr. nr Loomis	R					
49M100	N.F. Salmon Cr. nr Conconully	R					
49N050	W.F. Salmon Cr. @ mouth	R					
50A070	Columbia R nr Brewster	R	X				
50A090	Columbia R @ Bridgeport	R	X				
51A070	Nespelem R @ Nespelem	R			XXXXXXXXXX	XX X	
52A070	Sanpoil R @ Keller	R	XXXXXXX	X XX XX	XXXXXXXXXX	XX X	
52A110	Sanpoil R 13 mi S. Republic	R				X	
52A170	Sanpoil R blw Republic	R		X			
52A190	Sanpoil R abv Republic	R		X		X	
52B070	Lake Roosevelt from Keller Ferry	R				X	
53A070	Columbia R @ Grand Coulee	L		X XX XX	XXXXXXXXXX	XX X XXXXX	XXXX
54A050	Spokane R @ Mouth	R				XXXX	
54A070	Spokane R @ Long Lake (USGS)	R	X XXXXXXX X	XXXXXXXXXX	XX		
54A089	Spokane R 2 mi blw Ninemile dam	R		XX			
54A090	Spokane R @ Ninemile Br	R		X X			X
54A120	Spokane R @ Riverside State Pk	L		XXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXX
54A130	Spokane R @ Fort Wright Br	R		X X			
55B070	Little Spokane R nr Mouth	L		X X XXX	XXXXXXXXXX	XX XXXXXX	XXXX
55B075	Little Spokane @ Painted Rocks	R				X	
55B080	Little Spokane R nr Griffith Spring	R				XX	

Station Number	Name	Long-term or Rotating	Water Year Sampled <---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
55B082	Little Spokane R abv Dartford Creek	R				XX X	
55B085	Little Spokane nr Dartford	R	XXXXXXX				
55B090	Little Spokane R abv Wandermere	R		X			
55B100	Little Spokane R abv Deadman Creek	R				XX X	
55B200	Little Spokane @ Chattaroy	R				X X	
55C065	Deadman Cr nr Mouth	R				X	
55C070	Peone (Deadman) Creek abv L Deep Cr	R				XX	
55D070	Deer Cr nr Chattaroy	R				X	
55E070	Dragoon Cr nr Chattaroy	R				X	
56A070	Hangman Cr @ Mouth	L		X X XXX	XXXXXXXXXX	XX X XXXXX	XXXX
56A200	Hangman Creek @ Bradshaw Road	R				X	
57A120	Spokane R @ Spokane	R		X			
57A130	Spokane R @ Mission St Br	R		X X			
57A145	Spokane R @ Trent Br	R		X			
57A150	Spokane R @ Stateline Br	L	X XXXXXX X	XX X X		XXXXXXXXX	XXXX
57A190	Spokane R nr Post Falls	R		XXXXXXX	XXXXXXXXXX	XX	
59A070	Colville R @ Kettle Falls	R	XXXXXXXXXX	X X XX XX	XXXXXXXXXX	XX X	
59A080	Colville R abv Kettle Falls	R				X	X
59A110	Colville R @ Blue Creek	R		X			X
59A130	Colville R @ Chewelah	R		X			
59B070	Little Pend Oreille @ Hwy 395	R					X
60A050	Kettle R @ Hedlund Bridge	R	X				
60A070	Kettle R nr Barstow	L	XXXXXXX X	X X XX XX	XXXXXXXXXX	XX XXXXXX	XXXX
61A070	Columbia R @ Northport	L	X XXXXXXXXXX	XXXXXXXXXX	XX	XXXXXXXXX	XXXX
61B070	Deep Ck nr Mouth	R				X	X
61C070	Onion Cr nr Northport	R				X	
61D070	Sheep Cr nr Northport	R				X	
62A070	Pend Oreille R @ Waneta BC (USGS)	R	XXX				
62A080	Pend Oreille R @ Border	R		XXXXXX	XX		

Station Number	Name	Long-term or Rotating		Water Year Sampled <---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
62A090	Pend Oreille @ Metaline Falls	R	X	XXX			XX XX	XXXX
62A150	Pend Oreille R @ Newport	L	X	XXXXXXX X	X XX	XXXXXXXXXX	XXXXXXXXXX	XXXX

Appendix B

Historical changes in sampling and laboratory procedures, and large-scale environmental changes potentially affecting water quality

This appendix is intended to record changes in methods and procedures used by the Ambient Monitoring Section to collect and analyze river and stream water quality data. Other environmental changes that may potentially affect water quality over a large area are also recorded here. Many of the changes listed below are anecdotal and may or may not have affected data quality. Comments prior to October 1988 are based on interviews with individuals involved with the earlier program. Comments after that date have usually been recorded as the changes occurred.

GENERAL

Jun to Sep 1985: Laboratory moved from SWRO to Manchester.

Oct 1988: Implemented QA/QC program (See memo from David Hallock, October 17, 1988.)

Prior to WY91: Samples were sent to contract labs from time to time. These occurrences are not all recorded here. Records are confusing and only available from bench sheets archived by Manchester Environmental Laboratory.

1994: The use of Polyacrilamide (PAM) to control erosion from rill irrigation is becoming widespread in eastern Washington. Water quality affects are unknown.

1996: Began monitoring discharge at some stations ourselves (mostly basin stations), rather than contracting with USGS.

1997: Contracts for about 80% of the 1.045 million acres in Washington in the Conservation Reserve Program are scheduled to expire. (See http://pnwsteep.wsu.edu)

2001: Began running Central (November 2001) and Eastern (Feb 2002) runs out of regional offices. Barometric pressures calculated from airport readings, either uncorrected, if available, or re-converted to sea level.

Jan-Jun 2002: Some barometric pressures collected from the western part of the state may be off by 1.0 mmHg due to calibration errors. The effect of this amount of error on the percent oxygen saturation calculation is insignificant.

NUTRIENTS

General: Prior to 1980, USGS labs analyzed samples.

1966-1969: One gallon of sample was collected in glass jars and held at room temperature for indefinite periods without preservative.

1970-1973: Unknown methods; may have been preserved with HgCl. Filtered in field.

1973: Lab moved from Tacoma to Salt Lake City.

1973-1974: Chilled, no preservative. Held as long as one week. Filtered in field; kept in brown poly bottle.

1972-1974?: For a short time, TP and NO3 may have been added by filters (probably 72-74). (Personal communications with Joe Rinnella, USGS).

9/30/78: USGS Lab moved to Arvada, CO. Joint program samples sent there; samples collected for Ecology project only may have been analyzed in-house.

~1978: Chilled. Brown poly bottle (the brown poly bottle may have been introduced later). 30 day holding time for NO2+NO3 implemented (status of other nutrients is unknown). (Source of methods prior to 1979: pers. comm. Joe Rinnella, USGS, and Skinner, Earl L. "Chronology of Water Resources Division activities that may have affected water quality values of selected constituents in Watstore, 1970-86. Provisional Report Feb 1989.)

1979: For a while, the USGS lab reported nutrient results to the nearest 0.01 units. Values below 0.005 were reported as 0.00. USGS decided to change all Watstore data = 0 to

0.01K back to 1973 for NO2+NO3. Decision on other nutrients is unknown but they may also have been changed. Most of the 0s in our database have been converted to 0.01K (K-below the detection limit) but a few 0s may remain in the older data.

1980: USGS requires NO2+NO3 be preserved with HgCl. Status of other nutrients is unknown. Ecology requirements are unknown.

6/1/80 to 1986: Nutrients analyzed by Pat Crawford at SWRO.

Aug 1985: High phosphate values, presumably a result of lab error. (Coded '9-do not use' in our database). (See "Trends in Puget Sound," 1988, Tetra Tech, App. B.)

1986 to Apr 1987: Analyzed by various people, mostly Helen Bates, Steve Twiss, and Wayne Kraft at Manchester.

June, 1985: Switched from Technicon to Rapid Flow Analysis (Alpkem) autoanalyzers

Apr 1987 to present: Analyzed by various people at Manchester.

Jan 1987 to Jul 1987: NO3, NH3, and TP analyzed by contract lab,

Mar 1990: Began using MFS cellulose acetate filters for field filtration of nutrients. Previously use Millipore, type HA (cellulose nitrate?).

17 Sep 90-12 Oct 90: All nutrient samples were contracted out.

Oct 1990: Dissolved ammonia (P608) and dissolved nitrate+nitrite (P631) were added to the Marine network. Totals (P610 and P630) were dropped.

Feb 1991: All nutrients went to contract lab.

Mar 1991: All nutrients went to contract lab.

~1993: Began collecting nutrients in acid-washed poly-bottle passenger rather than in the stainless-steel bucket used for oxygen determinations.

Jul 1994: The phosphorus content in detergents is restricted statewide (SSB 5320). Phosphorus use had been limited in Spokane County one (?) year earlier.

Oct 2000: Nitrate+nitrite method changed from EPA 353.2 to SM 4500NO3I because the later method is more specific. Actual procedures were not changed.

May 2000: MEL switched from manual to inline digestion for total phosphorus. In early 2003, during the course of evaluating a different method for phosphorus analysis, MEL discovered that the in-line method contains a high bias (4 to 20 ppb). Trend analyses of total phosphorus data should be interpreted carefully if results collected between May 2000 and September 2003 are included. (See email from Dean Momohara to David Hallock, 31 March 2003.)

Oct 2000: TP methods changed from EPA 365.1 to SM4500PI. The former method specifies a manual digestion, while the later correctly refers to the in-line digestion used by MEL's Lachat instrument.

October 2000 through February, 2001: A low bias may apply to TN data. Except for December data, MEL deemed the bias to be small enough that the data did not need to be qualified. December TN results were coded as estimates (See email from M. Lee, M. to David Hallock, 8 March 2001.)

SUSPENDED SOLIDS

General: Filters were usually used, but sometimes Gooch crucibles were used.

Feb 1978: Began collecting as passenger to oxygen sampler (was previously collected as aliquot of oxygen sampler). (See memo from Bill Yake, 30 Jan 1978 and Ambient Monitoring Procedure-1978(?) notebook.)

Mid-1985 Amount filtered change from 250 (?) to 500 ml.
17 Sep 90-12 Oct 90: Suspended sediment samples were contracted out.
Apr 1991: Began collecting 1000 ml of sample.
Jul 2002: A number of suspended solids results entered into our database as '0' were deleted. We do not know if these results were below reporting limits or "missing data"; 138 results collected between 1972 and 1981 were affected.

CONDUCTIVITY

Feb 1978: Began calibrating twice monthly using 40, 70, 140, and 200 µmho/cm standards. (See memo from Bill Yake, 30 Jan 1978 and Ambient Monitoring Procedure-1978(?) Notebook)
Oct 1991:All meters were re-calibrated Oct 11, 1991. One conductivity meter was not calibrated above 500 µmhos/cm (and could not be calibrated). This meter had last been calibrated about 1 year earlier. Most meters read higher than the 100 µmhos/cm standard.
Oct 1994: Switched from Beckman model Type RB-5 (which could not be field calibrated) to Orion Model 126 meter, calibrated daily.
1998: Orion meter calibration began drifting during the day. Sometimes meter could only be calibrated to within 4 µmhos of the standard. When this occurred, some samplers would correct the data, others would not. This problem has re-occurred from periodically through the present. Now, these data are coded "J" (estimate).

FECAL COLIFORM BACTERIA

General: for some period in the early 1980s, field personnel may have analyzed some samples
Oct 7, 1975 to Nov 1981: fecal data from eastern Washington may be questionable during this period.
1980 to Mar 1988: No changes; analyzed by Nancy Jensen and others at Manchester.
Mar 1988: Switched to new filter with slightly better recovery.

TURBIDITY

1970s: EPA specified a 2100A turbidimeter. Formerly, turbidity units were FTU (?)
Jan 1976: Turbidity units changed from Jackson Turbidity Units (JTU) to Nephelometric Turbidity Units (NTU). (Source: review of historical reports.) These are roughly equivalent when greater than 25 JTU/NTU, otherwise not.
Sept 1993: Lab began using a new turbidimeter, Hach model "Ratio X/R."
Jan 2003: In our database, the units for turbidity results collected prior to January were changed from NTU back to JTU. Though roughly equivalent at JTUs > 25, these are not equivalent for lower measurements; the original units should have been retained.

FIELD PH

Oct 7, 1975 to Nov 1981: pH data from eastern Washington are questionable during this period.
Feb 1978: Began calibrating meter twice monthly. Previous procedures unknown. (See memo from Bill Yake, 30 Jan 1978 and Ambient Monitoring Procedure-1978(?) notebook)
1986: Changed to Beckman digital pH meter with gel probe.
Dec 91: Changed to Orion model 250A meter with "spare water" liquid probe (uses 1M KCl, rather than 4M). Calibrate daily and check calibration three times during the sampling day.

TEMPERATURE

Feb 1978: Switched from thermometer in bucket to thermister in river. (See memo from Bill Yake, 30 Jan 1978 and Ambient Monitoring Procedure-1978(?) notebook)

Spring 1994: Switched to YSI 300 meter (accuracy +/- 0.4C)

Jan 1, 2001: Began calibrating thermisters prior to each run rather than annually. Some thermisters were found to be as much as 1-2 °C low.

OXYGEN

Oct 1, 1977 Began measuring barometric pressure to calculate percent saturation. Previous saturation calculations were presumably based on elevation.

March 1989: Began applying correction factor to results of Winkler analyses based on titration with sodium biiodate to correct sodium thiosulfate normality to 0.025. Previously, thiosulfate was standardized upon preparation, but not during use.

BAROMETRIC PRESSURE

___ 1995: Began calibrating barometer prior to each run using an on-site mercury barometer rather than pressure as reported by the Olympia airport.

CHLOROPHYLL

15 Mar 90: Switched to fluorometric method (from spectrophotometric). New method has lower detection limit (0.02 µg/L) but less accuracy. (See Memo from Despina Strong, 12 April 1990.)

HARDNESS

7/1/91: Began using 125 ml bottle with HNO3 as preservative. (Previously, aliquot from unpreserved general chemistry bottle was used.)

METALS

May, 1994: Implemented low-level dissolved metals monitoring at selected stations. Metals results prior to this date are questionable unless well above detection limits and have been quality-coded "9" in our database so that they will not routinely be retrieved. Quality problems include inconsistent blank correction and indications of simultaneous peaks and troughs in data series from unrelated stations for results above reporting limits.

Appendix C

Water Year 2002 raw data for the Ecology
River and Stream Ambient Monitoring Program

Data listed in this appendix are available in electronic format by contacting

Ecology Central Region: Chris Coffin (509 454-4257; ccof461@ecy.wa.gov)
Ecology Eastern Region: Jim Ross (509 456-2874; jros461@ecy.wa.gov)
Ecology Northwest Region: Bill Ward (360 407-6621; bwar461@ecy.wa.gov)
Ecology Southwest Region: Chad Wiseman (360 407-6682; cwis461@ecy.wa.gov)

Ambient monitoring data from the most recent complete Water Year are available over the Internet on Ecology's web pages (http://www.ecy.wa.gov/). Look under "Environmental Info." and then "Watersheds."

The first two digits of each station number is the Water Resource Inventory Area (WRIA) number. This number can be used to identify which Water Quality Management Areas (WQMA) or "basin" each station is in, according to the table, below:

Basin	WRIAs	Basin	WRIAs
Cedar/Green	8-9	Nooksack/San Juan	1-2
Columbia Gorge	27-29	Okanogan	48-53
Eastern Olympics	13-14, 16-19	Puyallup/Nisqually	10-12
Esquatzel/Crab Creek	36, 42-43	Skagit/Stillaguamish	3-5
Horseheaven/Klickitat	30-31	Spokane	54-57
Island/Snohomish	6-7	Upper and Lower Snake	32-35
Kitsap	15	Upper Columbia/Pend Oreille	58-62
Lower Columbia	24-26	Upper Yakima	38-39
Lower Yakima	37	Wenatchee	40, 44-47
Mid Columbia	41	Western Olympics	20-23

Remarks codes in historical data are defined below. Only "U" and "J" were used in WY 2002.

B,V	Analyte was found in the blank indicating possible contamination.
E	Result is an estimate due to interference
G, L	True result is equal to or greater than reported value
H	Sample was analyzed over holding time
J	The reported result is an estimate
K, U	The analyte was not detected at or above the reported result
N	Spike sample recovery outside control limits
P	Result is between the detection limit and the min. quantitation limit (applied to metals)
S	Spreader: one or more bacteria colonies were smeared, possibly obscuring other colonies
X	High background count of non-target bacteria, possibly obscuring additional colonies

Conventional Data Report

Nooksack R. @ Brennan

01A050

Class: A
Rivermile: 3.4
Latitude: 48 49 09.1
Longitude: 122 34 43.3
Waterbody: WA-01-1010

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/22/2001	10:50	7.8	3060	95	11.51	7.69	69 J	0.483 J	0.01 U	0.387 J		0.0052 J	16	42
11/13/2001	9:35	8.1	3550	91	11.39	7.78	52	0.353	0.016	0.291		0.0087	20	17 J
12/10/2001	10:00	4.6	4710	96	12.22	7.7	51	0.975	0.025	0.822		0.014	14	25
1/21/2002	9:40	4.1	3880	111	12.17	7.64	34	0.949	0.038	0.819		0.012	16	33 J
2/26/2002	9:30	3.4	6900	92	13.13	7.5	174	0.872	0.053	0.692		0.014	75	32 J
3/18/2002	9:55	4.2	2800	119	12.63	7.56	15	0.842	0.038	0.711		0.0076	12	12 J
4/22/2002	9:40	8.6	4090	94	11.52	7.56	53	0.518	0.034	0.431		0.0058	15	17 J
5/21/2002	9:40	7.9	6000	65	11.76	7.4	133	0.223	0.047	0.173		0.004	55	33 J
6/18/2002	9:10	10	6350	60	10.87	7.55	57	0.144	0.017	0.112		0.0042	33	13 J
7/23/2002	7:15	16.8	3600	73	9.6	7.52	32	0.147	0.01 U	0.106		0.0066	17	51 J
		Conductivity measured at lab.												
8/20/2002	9:45	15.2	1680	90	9.9	7.79	13	0.1	0.01 U	0.086		0.0069	5.5 J	
9/16/2002	10:45	13.5	1330	98	10.24	7.82	11	0.22	0.01 U	0.16		0.0087	8.6	77 J

Metals Data Report

Nooksack R. @ Brennan

01A050

Class: A
Rivermile: 3.4
Latitude: 48 49 09.1
Longitude: 122 34 43.3
Waterbody: WA-01-1010

Date/Time		Flow CFS	Hardness mg/L	Tot. Rec. Cadmium ug/L	Dissolved Cadmium ug/L	Tot. Rec. Chromium ug/L	Dissolved Chromium ug/L	Tot. Rec. Copper ug/L	Dissolved Copper ug/L	Tot. Rec. Lead ug/L	Dissolved Lead ug/L	Total Mercury ug/L	Dissolved Nickle ug/L	Tot. Rec. Arsenic ug/L	Tot. Rec. Zinc ug/L	Dissolved Zinc ug/L
10/22/2001	10:50		42.1	0.1 U	0.02 U	1	0.42	2.59	0.819	0.26	0.038	0.007	2.58	0.54	3.24	1.2
12/10/2001	10:00		44.4	0.1 U	0.02 U	2.2	0.6	2.48	1.04	0.35	0.073	0.008	2.65	0.54	9.3 J	1.3
2/26/2002	9:30		41.9	0.1 U	0.02 U	6.89	1.4	6.74	1.01	1.24	0.029	0.01	3.22	1.3	10.3 J	0.73
4/22/2002	9:40		46.2	0.1 U	0.02 U	1.6	0.85	2.14	0.711	0.32	0.024	0.0055	2.4	0.53	16.2	0.91
6/18/2002	9:10		30	0.1 U	0.02 U	4.6	0.88	3.61	0.54	0.68	0.03	0.0084	1.42	0.8	8.8	0.66
8/20/2002	9:45		40.5	0.1 U	0.02 U	0.8	0.26	0.93	0.38	0.16	0.02 U	0.002 U	1.23	0.41	5 U	1 U

Conventional Data Report

Nooksack R @ No Cedarville

01A120

Class: A
Rivermile: 30.8
Latitude: 48 50 30.5
Longitude: 122 17 32.3
Waterbody: WA-01-1020

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/22/2001	14:15	7.6	4510	68	11.91	7.61	180 J	0.366 J	0.015	0.251 J		0.003 UJ	34	
		pH was 7.77 before recalibration.												
11/13/2001	12:20	7.5	3610	70	11.59	7.6	45 J	0.173	0.018	0.127		0.0049	20	13
12/10/2001	13:25	4.6	3630	79	12.42	7.6	21	0.485	0.011	0.426		0.0061	11	8
1/21/2002	12:25	3.7	2980	86	12.57	7.58	24	0.349	0.027	0.305		0.005	14	6
		pH was 7.82 prior to recalibration.												
2/26/2002	12:45	4.6	5490	77	13.03	7.61	96	0.337	0.01	0.296		0.0047	34	1 U
3/18/2002	13:00	2.8	2600	94	13.33	7.78	14	0.319	0.01 U	0.279		0.0043	9	1
4/22/2002	12:40	7.4	3900	77	12.11	7.74	24	0.227	0.014	0.189		0.0035	13	1 U
5/21/2002	12:25	7.3	5210	60	11.76	7.75	58	0.124	0.01 U	0.086		0.003 U	36	11
6/18/2002	12:30	8.7	11600	36	11.35	7.68	603		0.01 U	0.091		0.0046	200	460
7/23/2002	10:10	12.8	3680	61	11	7.78	54	0.068	0.024	0.041		0.0032	32	23 J
		Conductivity measured at lab												
8/20/2002	13:10	12.1	1760	80	12.4	8.56	7	0.025 U	0.01 U	0.01 U		0.0031	7.6 J	
9/16/2002	13:40	12.1	1550	85	11.84	8.15	11	0.052	0.01 U	0.027		0.0032	8.6	27

Conventional Data Report

Nooksack R above the MF

01A140

Class: A
Rivermile: 40.8
Latitude: 48 50 17.5
Longitude: 122 09 10.4
Waterbody:

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/22/2001 15:50	7.3		71	11.81	7.55	112 J	0.298 J	0.011	0.206 J		0.003 UJ	20	20
11/13/2001 13:45	7.5		71	11.59	7.57	30 J	0.157	0.016	0.124		0.0038	15	3 U
12/10/2001 15:00	4.6		90	12.72	7.58	8	0.448	0.013	0.394		0.0054	3.1	5
1/21/2002 13:40	3.5		95	12.57	7.57	1	0.33	0.01 U	0.3		0.0037	3	1
2/26/2002 14:10	5.7		87	12.64	7.64	25	0.361	0.011	0.31		0.0034	11	1 U
3/18/2002 14:15	2.7		106	13.73	7.78	2	0.315	0.01 U	0.279		0.0034	1.2	1 U
4/22/2002 14:10	7.6		85	12.21	7.6	12	0.221	0.01 U	0.198		0.003 U	5	1 U
	Too windy for RP.												
5/21/2002 13:30	7.2		66	11.76	7.4	40	0.129	0.014	0.103		0.003 U	20	1
6/18/2002 14:00	8.2		46	11.35	7.29	316 J	0.109	0.01 U	0.07		0.0047	130 J	140
7/23/2002 12:20	12.8		59	11.3	7.28	34	0.06	0.016	0.04		0.0031	24	11
	Conductivity measured at lab.												
8/20/2002 14:50	12.4		78	11.9	8.47	7	0.025 U	0.01 U	0.021		0.003 U	7.3 J	
9/16/2002 14:40	11.4		81	11.84	7.62	17	0.071	0.01 U	0.036		0.003 U	12	23

Conventional Data Report

Sumas R @ Jones Road

01D080

Class: A
Rivermile:
Latitude: 49 00 00.7
Longitude: 122 14 03.5
Waterbody:

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/22/2001	13:20	9.4		313	7.57	7.66	7	2.04 J	0.053	1.62 J		0.0417 J	9.5	230
		TSS sample was inadvertently lost.												
11/13/2001	11:40	9.2		332	7.35	7.47	8	3.11	0.067	2.45		0.0467	6.8	63
12/10/2001	12:35	5.4		264	9.69	7.66	25	3.8	0.036	3.34		0.0789	15	60
1/21/2002	11:40	4.8		264	9.8	7.57	41	3.61	0.067	3.38		0.055	25	92 J
2/26/2002	11:55	4.9		248	10.75	7.57	66	3.46	0.125	2.94		0.0647	36	86
3/18/2002	12:15	3.8		295	11.04	7.63	20	3.7	0.084	3.36		0.0313	12	43
4/22/2002	11:30	10.5		285	8.57	7.59	16	3.29	0.071	2.8		0.0337	7.7	35
		Too windy for RP.												
5/21/2002	11:40	11.6		294	8.52	7.56	6	2.76	0.061	2.57		0.019	4.4	310
6/18/2002	11:35	14.1		318	8.37	7.63	5	3.11	0.103	2.9		0.016	5.6	430 J
7/23/2002	9:20	17.4		340	7.1	7.55	4	2.55	0.084	2.21		0.019	5.4	450 J
		Conductivity measured at lab.												
8/20/2002	12:20	14.3		319	9	7.7	1	2.65	0.024	2.54		0.019	5 J	
9/16/2002	12:50	13.8		318	8.75	7.7	1	2.66	0.019	2.55		0.019	3	450

Conventional Data Report

SF Nooksack @ Potter Rd

01F070

Class: A
Rivermile: 19
Latitude: 48 47 21.1
Longitude: 122 11 52.8
Waterbody:

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/22/2001 16:15	7.4		63	11.71	7.64	297	0.461 J	0.01 U	0.338 J		0.003 UJ	110	40
11/13/2001 14:15	8		66	11.39	7.57	39	0.208	0.027	0.158		0.0049	26	3 U
12/10/2001 15:30	4.6		69	12.12	7.46	13	0.569	0.014	0.503		0.0063	7.9	5
1/21/2002 14:20	3.6		74	11.88	7.48	16	0.416	0.025	0.344		0.0071	13	18 J
2/26/2002 14:45	5		65	13.03	7.54	70	0.333	0.011	0.298		0.0053	46	1
	Too windy for RP. Backup RP under log jam.												
3/18/2002 14:45	2.6		77	13.03	7.61	11	0.349	0.019	0.286		0.0049	10	1
4/22/2002 14:30	8.1		62	11.72	7.66	30	0.219	0.01	0.183		0.0039	21	1
	Too windy for RP.												
5/21/2002 16:05	7.6		51	11.86	7.47	48	0.119	0.01 U	0.083		0.0031	32	1
6/18/2002 14:30	8.7		39	11.44	7.48	549		0.01 U	0.121		0.006	240	480
7/23/2002 13:20	19		76	9.69	7.67	12	0.066	0.01 U	0.029		0.003 U	5.3	3 U
	Swimmers upstream of site. Conductivity measured at lab.												
8/20/2002 15:20	13.2		99	9.9	7.95	2	0.052	0.01 U	0.034		0.0038	1.2 J	
9/16/2002 15:10	15		110	9.95	7.71	4	0.122	0.01 U	0.067		0.0041	1.5	46

Conventional Data Report

MF Nooksack R

01G070

Class: AA
Rivermile: 4.9
Latitude: 48 47 05.3
Longitude: 122 06 42.1
Waterbody:

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/22/2001 15:15	6.6	1210 J	44	11.91	7.59	141 J	0.284 J	0.01 U	0.169 J		0.003 UJ	11	8
11/13/2001 13:10	6.7	520 J	51	11.99	7.52	9	0.107	0.01 U	0.066		0.0057	5.5	1
12/10/2001 14:15	3.5	353 J	62	13.03	7.73	3 J	0.223	0.01 U	0.185		0.0069	1.5	2
1/21/2002 13:05	2.4	291 J	66	13.06	7.61	5	0.164	0.01 U	0.138		0.0064	1.1	1
2/26/2002 13:35	3.1	480 J	53	13.53	7.66	3	0.161	0.01 U	0.113		0.0051	1.6	1 U
3/18/2002 13:45	1.6	219 J	71	13.93	7.76	1 U	0.124	0.01 U	0.09		0.0055	0.7	3
4/22/2002 13:35	5.4	469 J	53	12.8	7.69	2	0.106	0.01 U	0.076		0.0038	1.6	1 U
5/21/2002 13:05	6	868 J	41	12.25	7.51	5	0.073	0.01 U	0.038		0.003 U	2.6	1 U
6/18/2002 13:15	6.5	2000 J	28	12.02	7.4	61	0.106	0.01 U	0.056		0.003 U	22	88
7/23/2002 11:35	9.9	580 J	44	11.9	7.43	210	0.052		0.038		0.0043	95	3 U
	Conductivity measured at lab.												
8/20/2002 14:15	9.3	248 J	62	11.8	7.99	22	0.026	0.01 U	0.024		0.0047	14 J	
9/16/2002 14:15	9.4	568 J	51	11.94	7.78	618	0.124	0.01 U	0.071		0.0043	75	120

Metals Data Report

MF Nooksack R

01G070

Class: AA
Rivermile: 4.9
Latitude: 48 47 05.3
Longitude: 122 06 42.1
Waterbody:

Date/Time		Flow CFS	Hardness mg/L	Tot. Rec. Cadmium ug/L	Dissolved Cadmium ug/L	Tot. Rec. Chromium ug/L	Dissolved Chromium ug/L	Tot. Rec. Copper ug/L	Dissolved Copper ug/L	Tot. Rec. Lead ug/L	Dissolved Lead ug/L	Total Mercury ug/L	Dissolved Nickle ug/L	Tot. Rec. Arsenic ug/L	Tot. Rec. Zinc ug/L	Dissolved Zinc ug/L
10/22/2001	15:15		21.6	0.1 U	0.02 U	2.9	0.81	4.14	0.647	0.51	0.037	0.012	5.15	0.89	5.5	1.4
12/10/2001	14:15		29.9	0.1 U	0.02 U	0.85	0.72	0.85 J	0.45	0.1 U	0.02 U	0.0058	3.02	0.22	1.5 J	0.98
2/26/2002	13:35		24.8	0.1 U	0.02 U	0.94	1.2	0.59	0.3	0.1 U	0.02 U	0.002 U	2.56	0.2 U	1.1 J	1.4
4/22/2002	13:35		26.8	0.1 U	0.02 U	0.72	0.85	1.09	0.39	0.1 U	0.02 U	0.0051	2.62	0.2 U	2.7	0.68
6/18/2002	13:15		16.4	0.1 U	0.02 U	4.9	0.83	2.47	0.52	0.49	0.03	0.018	3.66	0.34	5 U	0.77
8/20/2002	14:15		27.1	0.1 U	0.02 U	0.97	0.25	1.39	0.27	0.2	0.02 U	0.002 U	1.59	0.23	5 U	1 U

Conventional Data Report

Terrell Cr. nr Jackson Rd.

01H070

Class: AA
Rivermile:
Latitude: 48 54 04.0
Longitude: 122 44 47.4
Waterbody:

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
12/10/2001	11:20	4.3		103	11.21	7.39	7	1.67	0.032	0.999		0.316	7.2	28
		Flow												
1/21/2002	10:30	3.7		102	11.58	7.38	7	1.43	0.035	0.906		0.123	7.3	65 J
		Flow												
2/26/2002	10:25	3.7		89	12.64	7.43	8	1.04	0.034	0.516		0.0339	7.1	8 J
		Flow												
3/18/2002	10:40	2.2		101	12.93	7.51	3	0.966	0.049	0.432		0.0869	3.9	3
		Flow												

Conventional Data Report

Skagit R nr Mount Vernon

03A060

Class: A
Rivermile: 15.9
Latitude: 48 26 43.0
Longitude: 122 20 02.0
Waterbody: WA-03-1010

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/23/2001	8:20	8.8	19200	47	11.41	7.51	88	0.265 J	0.033	0.162 J		0.003 U	29	59 J
11/13/2001	15:30	9.1	13100	54	11.29	7.48	33 J	0.159	0.019	0.104		0.0053	3.5	1800 J
12/10/2001	16:30	5.6	16400	58	12.32	7.42	10	0.252	0.01 U	0.215		0.0062	4.9	9
1/21/2002	15:35	4.3	19500	57	12.37	7.41	21	0.197	0.022	0.159		0.0039	11	16
		pH was 7.79 prior to recalibration.												
2/26/2002	15:45	4.5	25700	53	12.94	7.45	64	0.212	0.018	0.159		0.0038	16	2
3/18/2002	15:50	3.9	15500	68	12.93	7.46	19	0.167	0.01 U	0.125		0.003 U	3.1	5
4/22/2002	15:25	7.2	19900	57	12.61	7.6	22	0.153	0.01 U	0.119		0.003 U	6.5	1 U
5/21/2002	15:30	8.4	26600	45	11.66	7.42	35	0.101	0.01 U	0.071		0.003 U	7.7	8
6/18/2002	15:40	9.4	31900	36	11.25	7.44	34	0.088	0.01 U	0.062		0.003 U	12	30
7/23/2002	15:15	14	24100	39	10.7	7.58	17	0.056	0.01 U	0.031		0.0032	5.5	7
		Conductivity measured at lab.												
8/20/2002	14:30	13.9	8640	51	10.4	7.64	17	0.044	0.01 U	0.033		0.003 U	3.4 J	
9/16/2002	16:10	13.7	6990	52	10.24	7.51	12	0.064	0.01 U	0.031		0.0039	3.8	10

Conventional Data Report

Samish R nr Burlington

03B050

Class: A
Rivermile: 10.4
Latitude: 48 32 45.4
Longitude: 122 20 13.0
Waterbody: WA-03-2010

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/22/2001	10:00	9	254	84	10.8	7.55	79 J	1.14 J	0.027	0.849 J		0.011 J	26	560 J
		pH was 7.33 before recalibration												
11/13/2001	8:30	9.4	144	86	10.78	7.49	10 J	0.814	0.035	0.643		0.0098	3.1	42 J
12/10/2001	8:45	5.6	794	60	12.12	7.38	21	1.11	0.025	0.948		0.0068	10	35 J
1/21/2002	8:45	4.6	458	69	12.57	7.35	13	1.08	0.041	0.95		0.007	9.3	27 J
		PH was 7.07 before recalibration. USGS installed new flow guage.												
2/26/2002	8:15	4.4	732	56	13.03	7.28	39	0.995	0.019	0.86		0.005	16	7 J
3/18/2002	8:45	4.3	364	66	13.23	7.42	12	0.929	0.014	0.801		0.0054	5.8	12 J
4/22/2002	8:35	9.5	389	63	11.82	7.15	11	0.762	0.015	0.65		0.005	6.1	43 J
5/21/2002	8:35	9.5	289	66	11.07	7.14	35	0.586	0.019	0.469		0.0051	6.4	150 J
6/18/2002	8:15	12.3	245	81	10	7.29	94	0.814	0.033	0.641		0.0091	45	6400 J
		Fairly turbid; looks organic												
7/23/2002	14:35	17.6	72	112	10.4	7.86	3	0.65	0.01 U	0.678		0.007	1.4	100
		Bathers and dog upstream of site. Conductivity measured at lab.												
8/20/2002	8:35	12.7	51	112	10.19	7.58	1	0.745	0.01 U	0.694		0.0056	1.2 J	
9/16/2002	9:45	12.9	42	118	10.14	7.67	3	0.891	0.022	0.77		0.0097	1.7	200 J

Conventional Data Report

Skagit R @ Marblemount

04A100

Class: AA
Rivermile: 78.2
Latitude: 48 31 37.0
Longitude: 121 25 40.0
Waterbody: WA-04-1090

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/23/2001	9:50	7.5	6690	38	11.61	7.59	23	0.19 J	0.022	0.126 J		0.003 U	7.3	17 J
11/14/2001	8:10	6.8	14200	23	11.89	7.21	92 J	0.164	0.02	0.073		0.003	23	27 J
12/11/2001	8:45	6.1	3270	55	11.91	7.62	2	0.124	0.01 U	0.095		0.0034		1 J
1/22/2002	8:30	4.5	7940	58	12.07	7.48	2	0.112	0.01 U	0.081		0.0036	1	1 UJ
2/27/2002	8:35	3.9	9020	57	13.03	7.46	5	0.107	0.01 U	0.078		0.003 U	1.4	1 U
3/19/2002	8:25	3.8	7780	65	12.83	7.63	2	0.093	0.01 U	0.066		0.003 U	0.6	1 J
4/23/2002	8:20	5	6090	56	12.8	7.58	1	0.093	0.01 U	0.068		0.003 U	0.7	1 UJ
5/22/2002	8:05	6.9	9220	52	12.05	7.4	1 U	0.098	0.01 U	0.075		0.003 U	0.8	5 J
6/19/2002	8:15	7.8	10400	34	11.83	7.44	3	0.075	0.01 U	0.061		0.003 U	2.6	3 J
7/24/2002	8:30	10.2	9580	40	12	7.26	1 U	0.051	0.01 U	0.042		0.003 U	1.7	6 J
		Conductivity measured at lab.												
8/21/2002	8:00	10.4	3380	44	11.1	7.34	1	0.047		0.05		0.003 U	1.2	4 J
9/17/2002	8:00	10.2	3410	42	10.94	7.21	1 U	0.08	0.01 U	0.054		0.003 U	0.8	6 J

Conventional Data Report

Stillaguamish R nr Silvana

05A070

Class: A
Rivermile: 11.1
Latitude: 48 11 49.5
Longitude: 122 12 32.0
Waterbody: WA-05-1010

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/23/2001	13:20	7.6	17200	38	11.91	7.22	588 J	0.289 J	0.016	0.311 J		0.0039	320 J	200
		TP and TPN were filtered due to high turbidity												
11/14/2001	11:40	8.3	26300	26	11.89	7.08	1290		0.032	0.141		0.0076	800 J	200
12/11/2001	12:50	4.8	3890	58	12.52	7.47	56	0.618	0.014	0.547		0.008	60	20
1/22/2002	12:10	3.3	3810	58	12.87	7.47	47	0.574	0.016	0.506		0.0081	45	23
2/27/2002	12:05	3.8	5280	52	13.03	7.21	27	0.368	0.023	0.335		0.0057	20	3
3/19/2002	11:50	3.6	3550	60	13.13	7.37	15	0.453	0.017	0.375		0.0065	11	15
4/23/2002	11:35	5.7	3420	42	12.51	7.27	59	0.256	0.012	0.201		0.0044	40	8
5/22/2002	11:35	8.4	4880 J	37	11.56	7.14	11	0.136	0.01 U	0.1		0.003 U	8.7	9
		Check Bar was +1 ft.												
6/19/2002	11:45	9.4	4300 J	32	11.25	7.17	11	0.124	0.01 U	0.077		0.0034	7.8	38
		WWG needs maintenance - Check Bar is + 1 ft and counter lacks a screw.												
7/24/2002	12:40	19.6	1780 J	61	10	7.48	3	0.072	0.01 U	0.041		0.0037	1.7	24
		Conductivity measured at lab.												
8/21/2002	12:00	15.7		84	10.19	7.59	2	0.123	0.01 U	0.09		0.0097	1.4	29
		Gage is Broke												
9/17/2002	11:50	13		49	10.04	7.28	91	0.489	0.012	0.341		0.0063	110	580 J
		Gage Broke												

Conventional Data Report

SF Stillaguamish @ Arlington

05A090

Class: A
Rivermile: 18.2
Latitude: 48 12 03.2
Longitude: 122 07 04.0
Waterbody: WA-05-1040

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/23/2001 12:30	7.7		29	12.12	7.19	504 J	0.197 J	0.014	0.216 J		0.003 U	255 J	110
TP and TPN were filtered due to high turbidity													
11/14/2001 11:00	8.4		25	11.99	7.22	1500		0.024	0.118		0.0071	1200 J	190 J
12/11/2001 12:10	4.8		52	12.52	7.42	96	0.593	0.014	0.526		0.0068	85	20
1/22/2002 11:30	3		51	13.06	7.52	58	0.569	0.097	0.503		0.0074	55	42
2/27/2002 11:30	3.4		44	13.43	7.19	16	0.36	0.014	0.319		0.0035	14	5
3/19/2002 11:15	3.5		53	13.23	7.48	8	0.465	0.022	0.378		0.0052	9	39
4/23/2002 11:05	5.4		36	12.8	7.31	31	0.23	0.01	0.183		0.0033	23	7
5/22/2002 10:55	7.8		32	11.86	7.31	8	0.132	0.01 U	0.102		0.003 U	6.3	11
6/19/2002 11:15	9.1		27	11.35	7.32	8	0.107	0.01 U	0.069		0.003 U	6.3	23
7/24/2002 12:00	19.1		44	9.69	7.65	3	0.093	0.01 U	0.054		0.003 U	1.6	12
Conductivity measured at lab.													
8/21/2002 11:25	15.7		69	9.69	7.67	2	0.165	0.01 U	0.131		0.0039	1.4	29
9/17/2002 11:15	13.3		42	10.44	7.44	77	0.354	0.01 U	0.246		0.0044	85	650 J

Conventional Data Report

SF Stillaguamish nr Granite Falls

05A110

Class: AA
Rivermile: 34.6
Latitude: 48 06 10.5
Longitude: 121 57 07.0
Waterbody: WA-05-1050

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/24/2001	14:15	6.3	2300	35		7.37	605	0.263 J	0.011	0.182 J		0.003 U	500	6
		DO result not noted on field sheet. TP and TPN were filtered due to high turbidity												
11/12/2001	14:50	7.6	436	48	12.09	7.58	45	0.152	0.021	0.125		0.0051	38	1 U
12/12/2001	14:00	3.6	620	44	12.92	7.74	71	0.227	0.054	0.198		0.0053	55	8
1/23/2002	13:50	1.6	654	44	13.76	7.75	91	0.19 J	0.024 J	0.157		0.0051	100	3 J
2/25/2002	13:50	3	1510	30	14.13	7.33	34	0.127	0.023	0.111		0.003 U	21	2
3/20/2002	13:20	1.6	672	41	14.22	7.45	60	0.191	0.01 U	0.139		0.0043	50	5
4/24/2002	13:20		1000	34	13.2	7.13	22	0.104	0.01 U	0.081		0.003 U	21	1 U
5/20/2002	12:45	6.2	1890	25	12.45	7.12	10	0.088	0.022	0.062		0.003 U	22	14
6/17/2002	13:10	8.2	1240	24	11.73	7.13	6	0.06	0.01 U	0.036		0.003 U	3.2	2
7/22/2002	15:30	16.5	513	35	10.3	7.37	36	0.054	0.032	0.022		0.0037	35	4
		Conductivity measured at lab.												
8/19/2002	14:25	16.3	224	51	10.1	7.6	3	0.036	0.01 U	0.024		0.0047	1.1	5
9/18/2002	14:50	12.1	254	40	11.14	7.45	5	0.135	0.01 U	0.076		0.0049	4.1	25

Conventional Data Report

NF Stillaguamish @ Cicero

05B070

Class: A
Rivermile: 9.5
Latitude: 48 16 03.0
Longitude: 122 00 42.5
Waterbody: WA-05-1020

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/23/2001	11:50	7.1	10100	32	12.12	7.4	580	0.385 J	0.017	0.368 J		0.003 U	300 J	120
		TP and TPN were filtered due to high turbidity												
11/14/2001	10:20	8	15400	24	11.99	7.06	671 J		0.026	0.177		0.0062	260	92 J
12/11/2001	11:30	4.6	1860	58	12.62	7.52	13	0.456	0.015	0.402		0.0088	9.1	13
1/22/2002	10:55	2.4	1790	57	12.87	7.71	29	0.384	0.014	0.338		0.0074	20	16
2/27/2002	10:50	3.5	2510	48	13.23	7.39	39	0.266	0.01 U	0.234		0.0054	30	2
3/19/2002	10:35	3.6	1750	59	13.13	7.47	30	0.314	0.025	0.249		0.0068	20	18
4/23/2002	10:35	5.4	2330	42	13	7.32	44	0.194	0.01 U	0.149		0.0044	30	2
5/22/2002	10:00	7	2240	38	11.76	7.22	17	0.118	0.01 U	0.075		0.003 U	12	9
6/19/2002	10:40	8.4	1930	34	11.54	7.22	13	0.105	0.01 U	0.063		0.0036	7.9	24
7/24/2002	10:55	16.6	778	60	10.9	7.71	4	0.07	0.01 U	0.026		0.0044	2.6	8
		Conductivity measured at lab.												
8/21/2002	10:40	14.1	438	85	10.4	7.71	4	0.04	0.01 U	0.013		0.0081	2.7	15
9/17/2002	10:05	11.7	1050	49	10.54	7.64	39	0.421	0.012	0.306		0.0059	15	250 J

Conventional Data Report

NF Stillaguamish nr Darrington

05B110

Class: A
Rivermile: 30
Latitude: 48 16 48.7
Longitude: 121 42 04.2
Waterbody: WA-05-1020

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/23/2001	11:00	6.8	1520	31	12.12	7.34	201 J	0.547 J	0.012	0.474 J		0.003 U	80	92
		TP and TPN were filtered due to high turbidity												
11/14/2001	9:35	7.5	8900 J	20	11.79	7.04	284 J		0.014	0.168		0.0043	80	43 J
12/11/2001	10:15	4.5	405	48	12.32	7.29	2	0.359	0.011	0.316		0.0062	1.1	4
1/22/2002	10:00	2.6		46	12.67	7.43	2	0.284	0.01 U	0.254		0.005	1.2	9 J
		RP point buried by plowed snow.												
2/27/2002	9:55	3.6	706	41	13.03	7.21	16	0.238	0.018	0.2		0.0037	16	4
3/19/2002	9:40	3.2	367	46	13.03	7.38	2	0.225	0.01 U	0.188		0.0042	1.3	16
4/23/2002	9:50	4.7	597	36	12.7	7.31	4	0.131	0.01 U	0.109		0.003 U	2.3	1
5/22/2002	9:20	6.1	706	30	11.86	7.32	3	0.08	0.01 U	0.053		0.003 U	2.5	7 J
6/19/2002	9:30	7.9	533	27	11.25	7.28	6	0.076	0.01 U	0.044		0.003 U	1.1	18 J
7/24/2002	9:50	13.1		38	10.6	7.25	1 U	0.083	0.01 U	0.047		0.003	0.5 U	10 J
		Too windy for RP. Conductivity measured at lab.												
8/21/2002	9:50	12.4	67	61	10.9	7.58	1	0.076	0.018	0.064		0.006	0.5 U	26 J
9/17/2002	9:10	11.3	111	53	10.84	7.32	2	0.129	0.01 U	0.08		0.0034	0.7	72 J

Metals Data Report

NF Stillaguamish nr Darrington

05B110

Class: A
Rivermile: 30

Latitude: 48 16 48.7
Longitude: 121 42 04.2
Waterbody: WA-05-1020

Date/Time		Flow CFS	Hardness mg/L	Tot. Rec. Cadmium ug/L	Dissolved Cadmium ug/L	Tot. Rec. Chromium ug/L	Dissolved Chromium ug/L	Tot. Rec. Copper ug/L	Dissolved Copper ug/L	Tot. Rec. Lead ug/L	Dissolved Lead ug/L	Total Mercury ug/L	Dissolved Nickle ug/L	Tot. Rec. Arsenic ug/L	Tot. Rec. Zinc ug/L	Dissolved Zinc ug/L
10/23/2001	11:00		15.4	0.12	0.02 U	2.3	0.31	7.49	1.03	2.61	0.061		0.69	1.24	9	1.2
2/27/2002	9:55		19.3	0.1 U	0.02 U	3.4	0.85	3.88	0.57	0.76	0.051	0.015	1.09	1.7	9 J	2
4/23/2002	9:50		17.7	0.1 U	0.02 U	0.5 U	0.37	0.98	0.47	0.1 U	0.02 U	0.0048	0.58	0.31	3	5.53
6/19/2002	9:30		12.7	0.1 U	0.02 U	0.71	0.46	0.74	0.47	0.17	0.02 U	0.0032	0.5	0.21	5 U	0.65
8/21/2002	9:50		27.9	0.1 U	0.02 U	0.34	0.25 U	0.41	0.46	0.1 U	0.02 U	0.002 U	0.1 U	0.62	5 U	1 U

Conventional Data Report

Snohomish R @ Snohomish

07A090

Class: A
Rivermile: 12.7
Latitude: 47 54 38.7
Longitude: 122 05 51.2
Waterbody: WA-07-1020

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/24/2001 13:25	7.7	17600	30	11.81	7.05	13	0.353 J	0.019	0.255 J		0.003 U	7.4	18
11/12/2001 13:45	7.7	6070	44	11.49	7.24	3	0.323	0.026	0.247		0.0056	1.6	14
12/12/2001 12:55	5	8660	52	13.33	7.29	6	0.632	0.025	0.531		0.0076	4.3	11
1/23/2002 13:00	3.7	10000	44	12.57	7.37	7	0.492	0.03	0.422		0.0057	5.3	9 J
2/25/2002 12:55	4.4	21200	33	13.33	7.12	24	0.344	0.017	0.276		0.0037	10	10
3/20/2002 12:25	3.8	12500	46	12.83	7.21	16	0.494	0.021	0.399		0.0057	7	25 J
4/24/2002 12:30	6.9	11900	37	12.21	7.12	8	0.275	0.015	0.213		0.0037	4.3	9
5/20/2002 11:50	8.5	17400	28	11.47	7.04	57	0.139	0.01 U	0.103		0.003 U	4	41
6/17/2002 12:05	9	19500	22	11.35	7.08	12	0.106	0.01 U	0.067		0.003 U	6.6	13
7/22/2002 14:30	17.5	6380	36	10.1	7.06	11	0.127	0.01 U	0.087		0.0035	3.1	8
Conductivity measured at lab.													
8/19/2002 13:25	17.6	2570	48	9.69	7.37	5	0.148	0.01 U	0.12		0.0046	1.4	7
high water backup from tide.													
9/18/2002 14:00	15	2700	54	9.95	7.19	11	0.244	0.01 U	0.168		0.0046	1.9	51

Conventional Data Report

Skykomish R @ Monroe

07C070

Class: A
Rivermile: 25.6
Latitude: 47 51 08.0
Longitude: 121 57 28.8
Waterbody: WA-07-1160

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/24/2001 12:40	7.3	11000	29	12.22	7.11	7	0.309 J	0.01 U	0.241 J		0.003 U	4.1	6
11/12/2001 12:50	7.9	4640	35	12.09	7.39	1	0.193	0.011	0.143		0.003 U	1.2	2
12/12/2001 12:05	4.6	5060	39	12.82	7.55	2	0.305	0.01 U	0.263		0.0037	1.4	1 U
1/23/2002 12:15	3.2	2570	32	13.26	7.48	3	0.22	0.01	0.189		0.003 U	3.8	5 J
2/25/2002 12:15	4.3	11200	27	14.03	7.23	8	0.207	0.01 U	0.157		0.003 U	5.1	1
3/20/2002 11:35	2.9	6650	33	13.83	7.32	3	0.245	0.01 U	0.2		0.0031	4.2	6
4/24/2002 11:30	6	7530	30	12.9	7.31	2	0.149	0.01 U	0.113		0.003 U	2	1
5/20/2002 11:05	7.5	11800	24	11.96	7.1	10	0.099	0.01 U	0.063		0.003 U	5.4	20
6/17/2002 11:25	8	9590	20	11.73	7.1	8	0.077	0.01 U	0.04		0.003 U	6.8	5
7/22/2002 13:50	17.7	4780	29	11	7.22	15	0.068	0.01 U	0.026		0.003 U	1.7	1
	Conductivity measured at lab.												
8/19/2002 12:20	15.4	2300	35	9.8	7.51	2	0.046	0.01 U	0.033		0.0032	1	6
9/18/2002 12:55	13.4		37	11.34	7.6	1	0.096 J	0.01 U	0.073		0.003 U	1.1	13
	Bridge painting prevented RP measurement												

Conventional Data Report

Snoqualmie R nr Monroe

07D050

Class: A
Rivermile: 2.7
Latitude: 47 48 14.3
Longitude: 122 00 06.0
Waterbody: WA-07-1060

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/24/2001	11:20	8	7500	26	11.81	7.01	26	0.308 J	0.01 U	0.232 J		0.003 U	9.1	27
		Stage height is an estimate												
11/12/2001	11:40	7.4	2160	50	11.29	7.1	3	0.386	0.013	0.325		0.0058	2.2	10
12/12/2001	11:25	5.4	3710	54	12.32	7.02	6	0.664	0.022	0.575		0.0074	3.5	15
1/23/2002	11:20	4.2		47	12.07	7.24	8	0.518	0.025	0.459		0.0062	5.2	
		Too windy for RP												
2/25/2002	11:25	4.6	9420	34	12.74	7.03	24	0.42	0.017	0.326		0.0057	11	6
3/20/2002	10:50	4.6		49	12.53	7.16	13	0.483	0.018	0.406		0.0061	7	40 J
		Too windy for RP												
4/24/2002	10:55	6.8		42	12.31	7.04	12	0.328	0.013	0.267		0.0043	6.7	10
		Too windy for RP.												
5/20/2002	10:30	8.9		29	11.47	6.92	13	0.181	0.01 U	0.138		0.003 U	5	13 J
		Too windy for RP.												
6/17/2002	10:40	9.6	7590	22	11.25	6.84	16	0.13	0.01 U	0.091		0.003 U	6.8	18
7/22/2002	12:20	17.7		43	9.69	7.02	7	0.166	0.011	0.12		0.0044	2.9	10
		Too windy for RP. Conductivity measured at lab.												
8/19/2002	11:40	18.4	760 J	58	9.19	7.25	3	0.197	0.016	0.157		0.0064	1.8	41
9/18/2002	12:05	15.1	903	65	9.75	7.26	3	0.307	0.01 U	0.236		0.0053	1.6	180 J

Conventional Data Report

Snoqualmie R @ Snoqualmie

07D130

Class: A
Rivermile: 42.3
Latitude: 47 31 37.5
Longitude: 121 48 39.3
Waterbody: WA-07-1100

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/24/2001	10:10	6.4	5080	25	12.42	7.15	16	0.331 J	0.01 U	0.271 J		0.003 U	8.6	3 UJ
11/12/2001	10:40	7.5	1380	39	11.49	7.16	3	0.267	0.01 U	0.232		0.0043	1.5	5
12/12/2001	10:10	4.6	1860	43	11.91	7.46	2	0.391	0.01 U	0.363		0.0041	2.1	1
1/23/2002	10:15	3.5	1970	39	12.57	7.33	4	0.339	0.01	0.32		0.0049	3.8	1 UJ
2/25/2002	10:15	3	4330	28	13.83	7.19	13	0.261	0.01 U	0.219		0.003 U	6.4	3
3/20/2002	9:45	2.9	2790	39	13.23	7.19	13	0.36	0.016	0.306		0.0035	12	44 J
4/24/2002	9:50	4.8	2790	32	12.51	7.3	10	0.224	0.01 U	0.19		0.003 U	4.6	5
5/20/2002	9:30	7.3	5590	20	11.76	7.26	31	0.142	0.01 U	0.101		0.003 U	10	33 J
6/17/2002	9:40	8.1	4770	19	11.35	7.4	10	0.105	0.01 U	0.074		0.003 U	5.6	6 J
7/22/2002	11:00	14.7	1850	31	10.8	7.43	5	0.1	0.01 U	0.078		0.0036	2	5
		Conductivity measured at lab.												
8/19/2002	10:25	13.7	612	48	9.8	7.41	2	0.15	0.01 U	0.133		0.005	1	20
9/18/2002	10:30	11.5	659	45	10.34	7.32	3	0.265	0.01 U	0.198		0.0033 J	1.3	46 J

Conventional Data Report

Cedar R @ Logan St/Renton

08C070

Class: A
Rivermile: 1
Latitude: 47 29 09.0
Longitude: 122 12 28.0
Waterbody: WA-08-1143

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/23/2001 15:25	10.3	483	67	10.9	7.48	10	0.283 J	0.037	0.233 J		0.009	2	53
11/14/2001 13:35	10.2	2050	51	10.78	7.16	760		0.046	0.55		0.017	230 J	1100 J
12/11/2001 14:15	6.9	902	64	12.02	7.65	3	0.503	0.011	0.439		0.0093	1.4	17
1/22/2002 13:50	5.2	1280	50	12.27	7.71	6	0.317	0.01 U	0.283		0.0063	1.6	6 J
2/27/2002 13:45	6	930	62	12.84	7.56	6	0.395	0.01 U	0.361		0.007	1.8	1
3/19/2002 15:30	6.9	686	69	12.33	7.61	3	0.422	0.01 U	0.358		0.0068	1.8	21
4/23/2002 13:30	8	1370	46	12.7	7.39	8	0.229	0.01 U	0.198		0.0048	2.9	2
5/22/2002 13:00	11.1	602	65	11.86	7.59	3	0.196	0.01 U	0.167		0.0039	1	28
6/19/2002 13:25	13.5	1240	42	10.77	7.39	8	0.103	0.01 U	0.063		0.003 U	1.9	64
7/24/2002 14:50	19.3	248	81	10.9	8.19	6	0.144	0.014	0.066		0.0051	1	75
Bather and dog in near sample site. Conductivity measured at lab.													
8/21/2002 13:45	14.4	177	89	11.3	7.95	2	0.198	0.01 U	0.184		0.013	0.9	130
9/17/2002 13:20	14	227	81	11.44	7.83	5	0.222	0.01 U	0.179		0.01	1.4	100

Conventional Data Report

Cedar R nr Landsburg

08C110

Class: AA
Rivermile: 25.1
Latitude: 47 23 29.3
Longitude: 121 55 09.5
Waterbody: WA-08-1150

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/24/2001 9:10	8.5	480	55	11.61	7.62	1	0.218 J	0.01 U	0.186 J		0.003 U	0.9	2 J
11/12/2001 9:45	8.2	645	46	11.59	7.38	4 J	0.177	0.01 U	0.14		0.0052	1.1	1 UJ
12/12/2001 9:00	6.6	628	52	12.32	7.69	1	0.234	0.01 U	0.217		0.0066	0.6	1 UJ
1/23/2002 9:20	4.8	1140	39	12.57	7.8	1	0.184	0.01 U	0.161		0.0047	0.8	3 J
2/25/2002 9:20	5.9	780	48	12.64	7.53	2	0.256	0.01 U	0.217		0.0053	0.8	1 U
3/20/2002 8:50	5.8	767	48	12.23	7.51	6	0.309	0.01 U	0.279		0.0053	1.8	3 J
4/24/2002 9:00	6.6	1050	43	12.51	7.35	5	0.176 J	0.01 UJ	0.149 J		0.0039	1.3	1 UJ
5/20/2002 8:45	10.2	537	53	10.98	7.41	1 U	0.194	0.01 U	0.161		0.0043	0.6	2 J
6/17/2002 8:35	11.4	1000	39	10.77	7.42	2	0.115	0.01 U	0.077		0.004	0.7	5 J
7/22/2002 9:50	12.3	441	60	10.9	7.47	1	0.166	0.012	0.124		0.0058	0.5 U	4 J
	Conductivity measured at lab.												
8/19/2002 9:30	10.2	270 J	69	11.2	7.7	1	0.203	0.01 U	0.194		0.01	0.5 U	15
9/18/2002 9:20	10.5	314	63	10.94	7.56	1 U	0.186	0.01 U	0.162		0.0075 J	0.5 U	4 J

Metals Data Report

Cedar R nr Landsburg

08C110

Class: AA
Rivermile: 25.1
Latitude: 47 23 29.3
Longitude: 121 55 09.5
Waterbody: WA-08-1150

Date/Time		Flow CFS	Hardness mg/L	Tot. Rec. Cadmium ug/L	Dissolved Cadmium ug/L	Tot. Rec. Chromium ug/L	Dissolved Chromium ug/L	Tot. Rec. Copper ug/L	Dissolved Copper ug/L	Tot. Rec. Lead ug/L	Dissolved Lead ug/L	Total Mercury ug/L	Dissolved Nickle ug/L	Tot. Rec. Arsenic ug/L	Tot. Rec. Zinc ug/L	Dissolved Zinc ug/L
12/12/2001	9:00		23	0.1 U	0.02 U	0.5 U	0.3	0.78 J	0.36	0.1 U	0.02 U	0.002 U	0.32	0.27	1.4 J	0.85

Conventional Data Report

Green R @ Tukwila

09A080

Class: A
Rivermile: 12.4
Latitude: 47 27 56.0
Longitude: 122 14 47.9
Waterbody: WA-09-1020

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/23/2001 16:00	10.5	1070	69	10.6	7.42	18	0.291 J	0.014	0.214 J		0.0087	6.5	52
11/14/2001 14:20	9.7	2490	66	10.48	7.29	44		0.039	0.439		0.0338	19	610 J
12/11/2001 14:50	5.7	1710	83	11.91	7.52	8	0.841	0.023	0.693		0.0307	3.9	38
1/22/2002 14:40	4.5	2070	67	12.17	7.6	20	0.606	0.018	0.517		0.025	6.1	38
2/27/2002 14:15	4.4	2150	68	12.54	7.43	12	0.552	0.01 U	0.459		0.016	4.8	13
3/19/2002 16:00	5.9	1460	86	11.94	7.42	7	0.642	0.019	0.513		0.017	3.6	24
4/23/2002 14:00	7.5	2160	62	12.01	7.34	19	0.387	0.018	0.324		0.012	10	10
5/22/2002 13:30	9.5	2400	53	11.17	7.48	11	0.171	0.01 U	0.135		0.006	3.6	93
6/19/2002 14:10	12.3	1290	81	10	7.23	7	0.228	0.017	0.164		0.0067	2	66
7/24/2002 16:00	19.9	619	136	9.3	7.22	26 J	0.348	0.043	0.225		0.011	2.6	130
Conductivity measured at lab.													
8/21/2002 14:20	17.2	251	157	10.19	7.4	5	0.392	0.038	0.302		0.014	2.5	37
9/17/2002 13:45	16.3	251	152	9.45	7.49	9	0.484	0.051	0.321		0.013	2.9 J	230

Conventional Data Report

Green R @ Kanaskat

09A190

Class: AA
Rivermile: 57.6
Latitude: 47 19 10.0
Longitude: 121 53 32.3
Waterbody: WA-09-1030

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/24/2001	8:05	9	1590	48	12.02	7.23	5	0.164 J	0.01 U	0.09 J		0.003 U	2.5	5 J
11/12/2001	8:40	6.9	547	83	11.99	7.16	1	0.184	0.01 U	0.141		0.0085	1.4	10 J
12/12/2001	8:10	4.2	954	47	12.12	7.58	2	0.294	0.01 U	0.275		0.0085	0.8	2 J
1/23/2002	8:30	3.6	1540	40	12.97	7.71	3	0.257	0.01 U	0.232		0.0096	1.3	1 J
2/25/2002	8:30	3.5	2600	36	13.53	7.42	4	0.169	0.01 U	0.131		0.0082	2	2
3/20/2002	8:00	4.5	1130	39	12.93	7.48	7	0.29	0.01 U	0.245		0.0076	4.3	6 J
4/24/2002	8:10	6.1	1410	34	12.61	7.43	7	0.133	0.012	0.099		0.0083	9.8	3 J
5/20/2002	8:05	9.2	1430	35	11.47	7.56	2	0.06	0.01 U	0.021		0.0037	1.4	2 J
6/17/2002	7:45	9.5	1210	36	10.96	7.65	1	0.043	0.01 U	0.011		0.0048	1.2	8 J
7/22/2002	8:45	13.7	620	44	10.9	7.66	2	0.106	0.025	0.043		0.0043	0.7	2 J
		Conductivity measured at lab.												
8/19/2002	8:45	14.1	135	50	10.19	7.93	1	0.177	0.017	0.122		0.0088	0.8	55 J
9/18/2002	8:20	13.1	139	53	10.44	7.64	2	0.192	0.011	0.102		0.0068 J	0.9	15 J

Conventional Data Report

Puyallup R @ Puyallup

10A050

Class: A
Rivermile: 5.7
Latitude: 47 12 49.4
Longitude: 122 20 24.8
Waterbody: WA-10-1020

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/30/2001 12:44	9	3060	75	11.01	7.25	63 J	0.197 J	0.016	0.143 J		0.016	17	200
11/27/2001 14:00	6.3	2660	70	11.76	7.41	67	0.484	0.031	0.391		0.014	16	66
12/11/2001 12:55	5.3	4120	74	11.95	7.4	49	0.689	0.05	0.546		0.026	11	410
1/29/2002 13:45	3.3	3610	79	12.77	7.26	25	0.607	0.034	0.476		0.02	6.1	80
2/19/2002 15:36	6.1	3170	75	12.13	7.6	52 J	0.495	0.041	0.371		0.016	8 J	64
3/26/2002 12:44	6.6	3750	65	12.37	7.6	18	0.451	0.019	0.346		0.011	2.8	10
4/16/2002 15:11	6.6	8060	50	11.58	7.29	171	0.29	0.02	0.21		0.013	32	120
5/28/2002 15:50	11.2	6820	42	10.68	7.44	114 J	0.12	0.024	0.06		0.0086	19	57
6/25/2002 14:32	14.4	4730	46	10.09	7.51	51	0.081	0.017	0.047		0.013	23	17
7/30/2002 14:30	14.3	4250	45	10.5	7.11	864		0.017	0.058		0.014	450	57
8/27/2002 17:21	16.4	2490	57	9.69	7.21	304	0.093	0.015	0.084		0.018	150	57
9/24/2002 14:20	12.9	1020	85	10.73	7.28	74	0.29	0.039	0.205		0.029	80	92

Conventional Data Report

Puyallup R @ Meridian St

10A070

Class: A
Rivermile: 8.3
Latitude: 47 12 10.0
Longitude: 122 17 33.0
Waterbody: WA-10-1020

Date/Time	Temp	Flow	Conduc-tivity	Oxygen	ph	Suspend. Solids	Total Pers. N.	Ammonia Nitrogen	Nitrate+ Nitrite	Total Phosp.	Soluble Reactive P	Turbid-ity	Fecal Coliforms
	deg. C	CFS	umhos/cm	mg/L	std units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	NTU	#/100/mL
10/30/2001 12:10	9	3050	75	11.01	7.36	52 J	0.191 J	0.015	0.141 J		0.015	17	140
11/27/2001 13:00	6.2	3350	69	11.76	7.46	63 J	0.461	0.028	0.374		0.014	16	88
12/11/2001 12:37	5.4	4120	72	12.46	7.62	75		0.041	0.537		0.0351	11	280
1/29/2002 13:14	3.3	3630	78	12.77	7.21	19	0.597	0.04	0.478		0.0584	6.4	63
2/19/2002 14:52	6	3170	74	12.13	7.56	38 J	0.484	0.034	0.363		0.021	7.5 J	45
3/26/2002 12:23	6.6	3760	65	11.98	7.68	11	0.446	0.027	0.344		0.01	2.8	11
4/16/2002 14:05	6.7	8130	49	11.78	7.36	314	0.295	0.018	0.209		0.014	40	100
5/28/2002 15:02	11.2	6820	41	10.78	7.45	215 J	0.112	0.02	0.055		0.0073	22	74
6/25/2002 14:10	14.3	4740	46	10.09	7.48	38	0.08	0.02	0.045		0.012	23	8
7/30/2002 14:00	14.3	4080	45	10.3	7.31	761		0.024	0.052		0.013	400	43
8/27/2002 17:00	16.5	2490	57	9.6	7.44	240	0.091	0.013	0.078		0.018	130	31
9/24/2002 14:00	12.4	1030	82	10.83	7.58	60	0.195	0.02	0.143		0.028	75	130

Conventional Data Report

White River @ R Street

10C095

Class: A
Rivermile: 8
Latitude: 47 16 31.0
Longitude: 122 12 22.0
Waterbody: WA-10-1030

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/30/2001 11:15	7.6	273	90	12.64	7.75	23	0.201 J	0.01 U	0.162 J		0.023	5.1	17
11/27/2001 12:15	5.7	674	76	12.35	7.45	267 J	0.635	0.024	0.549		0.021	6.7	96
pH Recalibrated													
12/11/2001 12:02	5.8	257	136	12.16	7.47	22	2.21	0.154	1.73		0.137	7.3	3200 J
1/29/2002 12:25	3.8	251	117	12.97	7.64	5	1.52	0.087	1.27		0.059	2.4	1400
2/19/2002 13:56	7.6	302	91	12.43	8.27	3	0.697	0.01 U	0.598		0.026	1.3	29
3/26/2002 11:30	7.5	463	81	13.06	8.56	7	0.609	0.01 U	0.485		0.018	1.6	8
4/16/2002 13:24	6.4	3360	44	11.98	7.45	481	0.234	0.012	0.172		0.018	60	110
5/28/2002 13:57	10.3	1520	42	10.88	7.5	416	0.117	0.026	0.066		0.01	39	80
6/25/2002 13:18	13.7	776	44	10.38	7.85	51	0.063	0.012	0.032		0.014	20	4
7/30/2002 13:10	16.2	674	59	10	7.48	274		0.016	0.123		0.028	280	88
8/27/2002 16:08	19.2	683	68	9.5	7.73	198	0.096	0.01 U	0.096		0.028	150	22
9/24/2002 12:40	13.3	710	79	11.53	8.05	49	0.034	0.01 U	0.029		0.021	45	26

Conventional Data Report

Nisqually R @ Nisqually

11A070

Class: A
Rivermile: 3.4
Latitude: 47 03 43.0
Longitude: 122 41 42.0
Waterbody: WA-11-1010

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/30/2001 13:40	10.3	1080 J	74	10.8	7.38	32	0.203 J	0.017	0.152 J		0.012	35	13
11/27/2001 11:10	7.2	2820 J	56	11.56	7.37	35	0.317	0.01 U	0.237		0.0095	25	11 J
12/11/2001 11:00	6	3090 J	56	12.26	7.5	12	0.429	0.01 U	0.324		0.014	12	12
1/29/2002 14:36	4.7	2830 J	62	12		11	0.478	0.021	0.358		0.015	12	3
2/19/2002 12:51	6.4	1680 J	65	12.13	7.62	7	0.573	0.022	0.426		0.014	5.9	4
3/26/2002 10:40	6.4	2700 J	58	12.27	7.81	11	0.414	0.014	0.325		0.0096	4.4	2
4/16/2002 12:23	7.3	5360 J	53	11.58	7.27	74	0.303	0.016	0.211		0.0085	11	18
5/28/2002 16:38	10.6	1660 J	53	10.88	7.58	7	0.201	0.01 U	0.164		0.0063	3.6	42
6/25/2002 11:55	13.6	1180 J	60	10.48	7.69	6	0.174	0.01 U	0.12		0.01	2.5	14
7/30/2002 12:05	14.6	1180 J	57	10.5	7.49	6	0.147	0.01 U	0.092		0.0083	3.1	11
8/27/2002 15:08	16.4	943 J	58	10.6	7.79	5	0.104	0.01	0.086		0.012	4.5	3
9/24/2002 11:35	14.7	976 J	60	10.13	7.45	9	0.124	0.01 U	0.091		0.011	18	15

Metals Data Report

Nisqually R @ Nisqually

11A070

Class: A
Rivermile: 3.4
Latitude: 47 03 43.0
Longitude: 122 41 42.0
Waterbody: WA-11-1010

Date/Time		Flow CFS	Hardness mg/L	Tot. Rec. Cadmium ug/L	Dissolved Cadmium ug/L	Tot. Rec. Chromium ug/L	Dissolved Chromium ug/L	Tot. Rec. Copper ug/L	Dissolved Copper ug/L	Tot. Rec. Lead ug/L	Dissolved Lead ug/L	Total Mercury ug/L	Dissolved Nickle ug/L	Tot. Rec. Arsenic ug/L	Tot. Rec. Zinc ug/L	Dissolved Zinc ug/L
10/30/2001	13:40		28.5	0.1 U	0.02 U	0.5 U	0.2	2.94	0.875	0.37	0.056	0.0023	0.23	0.66	4	0.66
12/11/2001	11:00		23.9	0.1 U	0.02 U	0.5 U	0.36	2.24	1.05		0.048	0.0045	0.58	0.51	2 J	0.4 U
2/19/2002	12:51		25.8	0.1 U	0.02 U	0.5 U	0.35	1.58 J	0.88	0.1 U	0.02 U	0.0044	0.3	0.41	1.9	0.82
4/16/2002	12:23		22.2	0.1 U	0.02 U	0.5 U	0.45	2.44	0.994	0.3	0.042	0.006	0.37	0.46	2.8	1.3
6/25/2002	11:55		24.4	0.1 U	0.02 U	0.64	0.87	0.87	0.41	0.17	0.02 U	0.002 U	0.16	0.37	5 U	0.52
8/27/2002	15:08		24	0.1 U	0.02 U	0.48	0.45	0.81	0.57	0.14	0.02 U	0.002 U	0.28	0.47	5 U	1.1

Conventional Data Report

Deschutes R @ E St Bridge

13A060

Class: A
Rivermile: 0.6
Latitude: 47 00 43.0
Longitude: 122 54 07.0
Waterbody: WA-13-1010

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/29/2001	8:22	7.8	149	118	10.8	7.41	3	0.49 J	0.01 U	0.412 J		0.019	1.9	17 J
11/26/2001	7:45	6.8	579	83	10.88	7.23	7	0.69	0.027	0.579		0.023	6	18 J
		pH Recalibrated; pH=7.23 following recalibration.												
12/10/2001	8:56	6.2	735	86	11.35	7.05	8	0.776	0.013	0.675		0.019	5.3	12 J
1/28/2002	9:04	5.3	1010	73	11.48	7.16	18	0.803	0.016	0.681		0.019	9.7	52 J
2/18/2002	9:02	7.4	478	98	10.94	7.26	6	0.863	0.01 U	0.765		0.018	3.3	4 J
3/25/2002	9:11	8.4	611	90	11.08	7.23	11	0.779	0.011	0.663		0.014	4.9	3
4/15/2002	10:55	7.7	1500	59	10.89	7.17	51	0.548	0.026	0.403		0.012	26	160
		high flow, turbid, brown												
5/27/2002	10:00	13.6	216	105	10.09	7.26	3	0.676	0.01 U	0.624		0.0062	1.4	40
6/24/2002	10:00	14.9	135	127	9.02	7.34	3	0.883	0.022	0.818		0.021	1.6	69 J
7/29/2002	10:26	15.3	135	134	9.5	7.43	2	0.845	0.018	0.751		0.016	1.6	56
8/26/2002	12:20	15.3	118	134	10.3	7.59	5	0.827	0.013	0.769		0.016	1.8	19 J
9/23/2002	7:30	11.9	74	143	9.52	7.3	11 J	0.976	0.017	0.859		0.02	2	22 J

Metals Data Report

Deschutes R @ E St Bridge

13A060

Class: A
Rivermile: 0.6
Latitude: 47 00 43.0
Longitude: 122 54 07.0
Waterbody: WA-13-1010

Date/Time		Flow CFS	Hardness mg/L	Tot. Rec. Cadmium ug/L	Dissolved Cadmium ug/L	Tot. Rec. Chromium ug/L	Dissolved Chromium ug/L	Tot. Rec. Copper ug/L	Dissolved Copper ug/L	Tot. Rec. Lead ug/L	Dissolved Lead ug/L	Total Mercury ug/L	Dissolved Nickle ug/L	Tot. Rec. Arsenic ug/L	Tot. Rec. Zinc ug/L	Dissolved Zinc ug/L
10/29/2001	8:22		43.3	0.1 U	0.02 U	2.8	0.39	0.84	0.37	0.1 U	0.02 U	0.002 U	0.3	0.42	1 U	0.81
12/10/2001	8:56		32.3	0.1 U	0.02 U	0.65	0.43	1.54 J	0.719	0.11	0.026	0.0062	0.19	0.33	2 J	0.4 U
2/18/2002	9:02		35.9	0.1 U	0.02 U	0.63	0.52	1.13 J	0.535	0.1 U	0.02 U	0.004 U	0.3	0.34	2	1
4/15/2002	10:55		24.9	0.1 U	0.02 U	1.5	0.42	4.4	0.914	0.41	0.037	0.0084	0.34	0.53	3.9	0.6
6/24/2002	10:00		48.7	0.1 U	0.02 U	0.68	1.4	0.71	0.43	0.1 U	0.02 U	0.0026	0.32	0.37	5 U	0.75
8/26/2002	12:20		52.1	0.1 U	0.02 U	0.47	0.55	0.91	0.41	0.1 U	0.027	0.002 U	0.52	0.52	5 U	1 U

Conventional Data Report

Skokomish R nr Potlatch

16A070

Class: AA
Rivermile: 5.3
Latitude: 47 18 36.0
Longitude: 123 10 33.0
Waterbody: WA-16-1010

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/30/2001	9:40	8.5	658	71	10.6	7.12	2	0.103 J	0.01 U	0.084 J		0.0078	1.4	10 J
11/27/2001	9:40	6.9	1490	61	11.27	7.59	8	0.129	0.023	0.095		0.01	6.5	4 J
12/11/2001	9:45	6.4	1520	56	11.35	7.62	5	0.14	0.034	0.097		0.01	4.3	1
1/29/2002	9:56	5.4	1440	56	11.88	7.25	8	0.093	0.012	0.067		0.0094	6	4 J
2/19/2002	10:43	6.9	1520	54	11.64	7.46	22	0.078	0.01 U	0.049		0.0078	8.4	7
3/26/2002	9:43	7.1	1080	56	11.48	7.94	2	0.063	0.01 U	0.039		0.0081	1.7	1 J
4/16/2002	11:00	6.3	2510	42	11.88	7.39	20	0.048	0.01 U	0.044		0.0069	21	8
5/28/2002	11:54	10	795	56	11.17	7.57	3	0.025 U	0.01 U	0.01 U		0.0054	2.2	43
6/25/2002	10:40	12	452	66	10.19	7.59	1	0.055	0.01 U	0.022		0.0092	0.7	1
7/30/2002	10:40	11.5	277	71	10.3	7.59	1	0.053	0.01 U	0.024		0.0095	0.6	8
8/27/2002	13:55	12.7	214	71	10.6	7.22	1	0.025 U	0.01 U	0.021		0.01	0.5 U	7
9/24/2002	10:30	10.1	190	74	9.92	7.47	1	0.05	0.01 U	0.033		0.011	0.6	18

Conventional Data Report

Duckabush R nr Brinnon

16C090

Class: AA
Rivermile: 4.5
Latitude: 47 41 03.0
Longitude: 123 00 37.0
Waterbody: WA-16-3010

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/30/2001 8:40	6.4	157	82	12.12	7.45	1 U	0.074 J	0.01 U	0.069 J		0.0035	0.5 U	1 J
11/27/2001 8:35	5	476	74	12.64	7.42	2	0.056	0.01 U	0.049		0.0043	1.6	2 J
pH Recalibrated; pH=7.42 following recalibration.													
12/11/2001 8:30	4.7	328	76	12.76	7.45	1 U	0.047	0.01 U	0.043		0.0043	0.9	1 J
2/19/2002 9:31	4.7	448	57	12.63	7.41	2	0.047	0.01 U	0.022		0.003 U	1.2	4 J
3/26/2002 8:52	5	294	68	12.67	7.89	1 U	0.04	0.01 U	0.014		0.0032	0.7	1 UJ
4/16/2002 9:52	4.3	615	60	12.67	7.61	5	0.043	0.01 U	0.033		0.003 U	3.4	1
5/28/2002 10:42	6.3	806	47	11.86	7.64	13	0.042	0.01 U	0.022		0.003 U	7.4	8
6/25/2002 9:32	7.7	577	57	11.55	7.49	3	0.019	0.01 U	0.01 U		0.003 U	2.5	17 J
7/30/2002 9:49	11.2	219	70	11.1	7.72	1	0.032	0.01 U	0.01 U		0.0033	0.8	29
8/27/2002 12:45	12.2	106	81	10.8	7.79	1 U	0.025 U	0.01 U	0.011		0.0046	0.5 U	2
9/24/2002 9:25	9.4	80	86	11.73	7.78	1	0.032	0.01 U	0.026		0.0051	0.5 U	4 J

Conventional Data Report

Dungeness R nr Mouth

18A050

Class: A
Rivermile: 1
Latitude: 48 08 37.7
Longitude: 123 07 39.7
Waterbody: WA-18-1010

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/29/2001 16:17	7.2	164	148	11.81	7.75	3	0.103 J	0.01 U	0.065 J		0.0066	1.3	35
11/26/2001 15:40	5.1	477	113	12.54	7.92	8	0.114	0.013	0.077		0.0071	4.6	3
pH Outside Limits; pH=7.92 following recalibration; Staff Gage=14.94.													
12/10/2001 16:28	4.4	389	132	12.86	7.48	2	0.133	0.017	0.084		0.0092	2.7	18
1/28/2002 17:12	3	324	144	12.87	7.65	7	0.15	0.011	0.092		0.0069	3.5	31
2/18/2002 16:54	5.7	214	154	12.13	7.79	3	0.122	0.01 U	0.061		0.0051	2.1	5
3/26/2002 7:15	5.2	367	142	12.17	7.64	7	0.139	0.01 U	0.055		0.0044	4.6	5 J
4/16/2002 7:15	5	872	108	11.58	7.57	26	0.094	0.01 U	0.061		0.0045	12 J	8
5/28/2002 8:54	8.3	805	84	11.37	7.72	50	0.065	0.016	0.031		0.0036	19	47 J
6/25/2002 8:15	9.7	766	85	10.97	7.68	12	0.03	0.01 U	0.02		0.004	8.5	21 J
7/30/2002 7:55	11.7	340	102	10.7	7.87	3	0.064	0.01 U	0.035		0.0041	1.9	19 J
8/27/2002 10:55	12.8	140	129	10.9	7.83	2	0.046	0.01 U	0.049		0.0043	1	27 J
9/24/2002 7:55	10.9	104	152	10.53	7.52	2	0.109	0.01 U	0.081		0.0055	1.1	34 J

Conventional Data Report

Elwha R nr Port Angeles

18B070

Class: AA
Rivermile: 8.1
Latitude: 48 03 56.0
Longitude: 123 34 35.0
Waterbody: WA-18-2010

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/29/2001	15:20 8.6	257	97	11.91	7.77	2	0.039 J	0.01 U	0.017 J		0.003 U	1.4	1 U
11/26/2001	14:35 5.9	1970	70	12.54	7.39	17	0.058	0.021	0.042		0.0053	19	1
12/10/2001	15:22 4.7	1430	93	13.26	7.63	3	0.073	0.01 U	0.04		0.0056	5	1 U
1/28/2002	16:03 3.8	1690	84	12.87	7.79	25	0.063	0.068 J	0.037		0.0057	33	1
2/18/2002	15:51 4.8	860	109	12.63	7.72	5	0.045	0.01 U	0.032		0.0048	8.4	1
3/25/2002	15:13 6.1	1070	103	12.67	7.76	3	0.032	0.01 U	0.01 U		0.0035	4.7	1 U
4/15/2002	17:52 5.5	3030	82	12.37	7.73	31	0.049	0.015	0.031		0.0045	31	1 U
5/27/2002	15:55 8.4	2650	78	11.56	7.73	4	0.025 U	0.01 U	0.01 U		0.003 U	3.1	1
6/24/2002	16:38 10.1	2580	65	11.35	7.77	7	0.016	0.01 U	0.01 U		0.0034	7.4	1
7/29/2002	16:00 13.9	1370	73	10.1	7.66	2	0.025 U	0.01 U	0.01 U		0.0041	1.7	1 U
8/26/2002	18:37 14.7	755	85	10.19	7.84	2	0.025 U	0.01 U	0.01 U		0.0031	0.6	1 J
9/23/2002	14:45 14.3	377	97	10.63	7.83	1 U	0.035	0.01 U	0.01 U		0.0032	0.7	1 UJ

Conventional Data Report

Hoh R @ DNR Campground

20B070

Class: AA
Rivermile: 16.5
Latitude: 47 48 36.0
Longitude: 124 14 47.0
Waterbody: WA-20-2010

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/29/2001 13:40	7.5	2420	82	12.12	7.48	8	0.166 J	0.01 U	0.157 J		0.0052	6.2	2
11/26/2001 13:05	6.6	3410	72	11.96	7.14	21	0.153	0.019	0.142		0.0054	16	8
12/10/2001 13:52	6.3	4120	68	12.26	7.33	13	0.149	0.01 U	0.139		0.0053	9.4	6
1/28/2002 14:17	4.1	2960	65	12.67	7.37	19	0.131	0.026	0.109		0.0049	10	1
2/18/2002 14:15	6.4	1940	71	12.13	7.44	9	0.096	0.01 U	0.072		0.0043	5.7	1 U
3/25/2002 16:45	7.7	2120	71	12.17	7.43	5	0.081	0.011	0.05		0.0033	4.2	1 U
4/15/2002 15:54	6.7	5610	60	11.78	7.31	55	0.09	0.015	0.067		0.0037	26	4
5/27/2002 14:30	9.1	2250	69	11.37	7.62	14	0.028	0.01 U	0.01 U		0.003 U	7.5	5
6/24/2002 15:05	12.7	2020	69	10.67	7.77	4	0.016	0.01 U	0.01 U		0.0033	4.6	1 U
7/29/2002 14:35	12.7	1590	64	10.9	7.64	6	0.025 U	0.01 U	0.01 U		0.003 U	8.8	6
8/26/2002 16:12	16	920	69	10.19	7.72	3	0.025 U	0.01 U	0.01 U		0.003	3.2	7 J
9/23/2002 12:30	11.8	621	77	11.33	7.46	2	0.025 U	0.01 U	0.015		0.003 U	1.8	3 J

Conventional Data Report

Humptulips R nr Humptulips

22A070

Class: A
Rivermile: 23.6
Latitude: 47 13 48.0
Longitude: 123 57 38.0
Waterbody: WA-22-1010

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/29/2001	11:36	7.4		58	11.91	7.61	6	0.281 J	0.01 U	0.26 J		0.0072	5.5	6
11/26/2001	10:30	6.6		50	11.96	7.38	10	0.227	0.014	0.207		0.0069	10	10
12/10/2001	12:15	5.7		48	12.56	7.22	13	0.197	0.012	0.19		0.015	14	6
1/28/2002	11:55	4.6		45	12.47	7.33	13	0.185	0.025	0.158		0.007	13	5
2/18/2002	12:20	6.8		50	12.03	7.29	4	0.15	0.01 U	0.127		0.0056	3	7
3/25/2002	11:50	7.7		48	12.07	7.22	2	0.119	0.01 U	0.099		0.0043	2.3	1 U
4/15/2002	14:15	7		43	11.88	7.19	69	0.121	0.025	0.106		0.0049	60	3
5/27/2002	12:20	11.9		52	10.68	7.47	1	0.041	0.01 U	0.01 U		0.003 U	0.9	7
6/24/2002	13:20	16		57	10.19	7.81	1	0.044	0.01 U	0.019		0.0053	0.7	2
7/29/2002	12:55	16.3		58	10.1	7.73	1 U	0.063	0.01 U	0.019		0.0059	0.6	11
8/26/2002	15:29	18.9		65	9.8	7.43	2	0.025 U	0.01 U	0.015		0.0054	0.5 U	14 J
9/23/2002	10:15	12.9		68	10.53	7.29	1 U	0.086	0.01 U	0.044		0.0051	0.6	13 J

Conventional Data Report

Chehalis R @ Porter

23A070

Class: A
Rivermile: 33.3
Latitude: 46 56 17.0
Longitude: 123 18 45.0
Waterbody: WA-23-1010

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/29/2001	9:55	8.6	1320	91	10.8	7.62	6	0.922 J	0.021	0.8 J		0.021	3.1	33 J
11/26/2001	8:45	7.4	9850	76	10.29	6.88	27	1.04	0.035	0.874		0.018	14	56 J
12/10/2001	10:40	6.2	9280	76	11.15	7.18	24	0.907	0.021	0.786		0.017	9.3	27 J
1/28/2002	10:20	4.4	26500	56	11.38	7.38	35	0.858	0.027	0.716		0.014	23	45
		flooding												
2/18/2002	10:35	6.8	4980	80	11.24	6.96	28	0.931	0.033	0.779		0.013	8.1	10 J
		Steelhead flopping in river												
3/25/2002	10:10	9.6	7080	72	10.99	7.04	20	0.805	0.023	0.646		0.011	8.2	15
4/15/2002	12:15	8.9	16600	60	10.89	7.13	84	0.656	0.024	0.497		0.011	37	280
		near flood stage, turbid, brown												
5/27/2002	11:00	15.4	1200	91	9.8	7.5	8	0.469	0.01 U	0.373		0.003 U	2.1	26
6/24/2002	11:10	18.6	690	98	8.83	7.6	15	0.689	0.031	0.56		0.016	2.9	4 J
7/29/2002	11:30	18.7	490	105	8.8	7.66	4	0.708	0.035	0.552		0.012	2.2	24
8/26/2002	13:40	19.7	423	109	9.4	7.74	2	0.69	0.017	0.581		0.0095	1.5	14 J
		Did not get the stage												
9/23/2002	8:50	15.1	366	110	9.62	7.48	6	0.848	0.018	0.647		0.017	1.9	6 J

Metals Data Report

Chehalis R @ Porter

23A070

Class: A
Rivermile: 33.3
Latitude: 46 56 17.0
Longitude: 123 18 45.0
Waterbody: WA-23-1010

Date/Time		Flow CFS	Hardness mg/L	Tot. Rec. Cadmium ug/L	Dissolved Cadmium ug/L	Tot. Rec. Chromium ug/L	Dissolved Chromium ug/L	Tot. Rec. Copper ug/L	Dissolved Copper ug/L	Tot. Rec. Lead ug/L	Dissolved Lead ug/L	Total Mercury ug/L	Dissolved Nickle ug/L	Tot. Rec. Arsenic ug/L	Tot. Rec. Zinc ug/L	Dissolved Zinc ug/L
10/29/2001	9:55		30.5	0.1 U	0.02 U	0.5 U	0.4	1.74	1.26	0.17	0.048	0.0029	0.99	0.28	2.5	1.7
12/10/2001	10:40		25.2	0.1 U	0.02 U	1.2	0.43	2.79	0.737	0.21	0.027	0.0087	0.47	0.24	3.6 J	0.4 U
2/18/2002	10:35		27.2	0.1 U	0.02 U	0.97	0.47	2.07 J	0.676	0.15	0.02 U	0.004 U	0.46	0.2	2.7	0.99
4/15/2002	12:15		23.4	0.1 U	0.02 U	2.8	0.4	7.72	1.27	0.68	0.034	0.01	0.6	0.39	8.8	1.1
6/24/2002	11:10		36	0.1 U	0.02 U	0.97	1.2	1.94	1.02	0.89	0.03	0.0028	0.4	0.22	5 U	1.8
8/26/2002	13:40		40.7	0.1 U	0.02 U	0.97	0.39	1.4	1.03	0.1 U	0.02 U	0.0021	0.69	0.31	5 U	1 U

Conventional Data Report

Chehalis R @ Prather Rd

23A100

Class: A
Rivermile: 59.9
Latitude: 46 46 31.4
Longitude: 123 02 03.3
Waterbody: WA-23-1010

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/30/2001	15:20	9.1	835	103	10.7	7.15	4	0.841 J	0.042	0.693 J		0.022	2.8	14
11/27/2001	15:20	6.9	5050	86	10.58	7.16	13	1.01	0.037	0.873		0.015	8.9	63
12/11/2001	14:26	6.2	6030	74	11.45	7.18	15	0.922	0.03	0.801		0.021	9.1	41
1/29/2002	13:52	4.1	8500	77	11.78	6.83	27	0.875	0.043	0.715		0.016	15	25
2/20/2002	14:38	7.3	4100	76	11.54	7.21	15	0.68	0.038	0.531		0.016	9.2	41
3/26/2002	14:05	8.8	3680	66	10.99	7.44	10	0.634	0.032	0.538		0.013	6.3	1
4/17/2002	18:10	8.5	7240	61	11.08	7.05	21	0.605	0.03	0.459		0.013	11	64
5/29/2002	17:42	16.3	1080	115	10.58	7.5	4	0.328	0.024	0.207		0.015	2.7	61
6/26/2002	15:40	22.7	415	89	9.51	7.7	2	0.46	0.05	0.266		0.021	1.5	7
		It was too windy to get a tapedown												
7/31/2002	17:15	20.9	244	101	10	7.54	2	0.507	0.054	0.309		0.0357	1.5	15
8/28/2002	20:32	21.9	177	104	10.9	7.6	2	0.587	0.083	0.391		0.0458	1.2	8
9/25/2002	16:35	18	187	104	10.83	7.58	2	0.557	0.043	0.353		0.0373	1.6	6

Conventional Data Report

Chehalis R @ Dryad

23A160

Class: A
Rivermile: 101.7
Latitude: 46 37 52.0
Longitude: 123 14 56.0
Waterbody: WA-23-1100

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/31/2001	17:17	9	1110	71	11.11	7.13	22	1.62 J	0.01 U	1.58 J		0.0077	7.9	580
		TP and TPN were filtered due to high turbidity												
11/28/2001	15:15	6.4	3020	55	12.05	7.28	62	0.835	0.014	0.77		0.012	14	210
12/12/2001	15:16	6.6	1470	56	12.26	7.35	3	0.872	0.01 U	0.819		0.012	2.4	92
1/30/2002	16:35	5.1	1350	56	12.67	7.11	4	0.722	0.01 U	0.669		0.013	2.9	100
2/20/2002	15:45	6.2	1790	51	12.53	7.63	2	0.601	0.01 U	0.537		0.0088	2	1 U
3/27/2002	14:34	6.8	819	52	12.97	7.35	2	0.567	0.01 U	0.489		0.0092	1.6	2
4/17/2002	17:07	8.4	1920	51	12.07	7.42	6	0.544	0.01 U	0.496		0.0097	3	5
		chkbar 41.39, wwg 12.12												
5/29/2002	16:47	13.4	288	65	11.37	8.26	7	0.3	0.01 U	0.223		0.0045	2.1 J	110
6/26/2002	14:57	20.9	98	75	10.09	8.14	3	0.253	0.022	0.114		0.0068	1.8	29
7/31/2002	16:20	20.6	85	76	10.1	7.87	2	0.21	0.017	0.086		0.01	1.3	28
8/28/2002	19:38	21.3	78	80	9.1	7.67	2	0.127	0.014	0.045		0.0099	1.4	15
9/25/2002	15:25	15.9	77	86	10.33	7.61	1 U	0.099	0.01 U	0.017		0.0075	1.1	15

Conventional Data Report

Willapa R nr Willapa

24B090

Class: A
Rivermile: 17.7
Latitude: 46 39 01.0
Longitude: 123 39 08.0
Waterbody: WA-24-2020

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/31/2001	16:19	9.8	920	61	10.6	7.22	32	0.802 J	0.013	0.728 J		0.0092	14	580
TP and TPN were filtered due to high turbidity														
11/28/2001	14:20	9	3000	53	11.17	6.88	157	0.998	0.025	0.928		0.015	29	690
12/12/2001	14:21	7	1140	55	12.16	7.11	11	0.97	0.014	0.935		0.0096	4	14
1/30/2002	15:35	6	1360	53	12.07	6.97	13	0.922	0.029	0.862		0.0099	6.3	130
2/20/2002	14:12	7.4	740	51	12.03	7.28	5	0.764	0.01 U	0.682		0.0069	2.9	9
3/27/2002	13:31	8.2	650	51	11.98	7.39	4	0.733	0.011	0.659		0.0077	2	4
4/17/2002	16:00	8.5	1840	48	11.68	7.04	18	0.767	0.01 U	0.699		0.0073	7	24
5/29/2002	15:50	13.3	375	52	10.68	7.46	8	0.337	0.01 U	0.275		0.0041	3	300
6/26/2002	13:50	21.5	69	68	9.32	7.44	4	0.342	0.034	0.182		0.0059	1.5	63
7/31/2002	15:20	19	43	67	10	7.44	4	0.296	0.022	0.156		0.0084	1.9	79
8/28/2002	18:50	19	25	71	9.19	7.37	4	0.225	0.023	0.127		0.0078	2	44
9/25/2002	14:20	17.9	18	78	9.52	7.31	2	0.263	0.015	0.121		0.0075	2.3	100

Conventional Data Report

Naselle R nr Naselle

24F070

Class: A
Rivermile: 17.4
Latitude: 46 22 23.0
Longitude: 123 44 44.0
Waterbody: WA-24-3010

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/31/2001	14:04	9.5	648	54	11.31	7.3	12	0.622 J	0.01 U	0.578 J		0.0088	6.5	250
11/28/2001	12:50	7.9	1740	39	11.86	6.8	82		0.018	0.483		0.0087	30	200
12/12/2001	12:32	7.5	783	46	12.46	7.27	6	0.595	0.01 U	0.568		0.01	3.6	14
1/30/2002	13:33	5.3	635	45	12.57	7.12	6	0.55	0.01 U	0.507		0.011	3.4	37
2/20/2002	13:06	6.4	329	46	12.53	7.43	2	0.468	0.01 U	0.412		0.0089	2	17
3/27/2002	12:23	7.6	336	44	12.07	7.53	1	0.439	0.01 U	0.407		0.0086	1.3	10
4/17/2002	13:00	7.9	1120	43	12.07	7.04	9	0.482	0.01 U	0.443		0.009	4.5	8
5/29/2002	13:05	11.4	370	46	10.78	7.63	9	0.334	0.01 U	0.32		0.0036	7	150
6/26/2002	12:40	16.5	73	57	10.09	7.59	1 U	0.238	0.015	0.173		0.0062	0.8	19
7/31/2002	13:09	16.8	45	57	10.4	7.66	2	0.217	0.01 U	0.163		0.0082	0.7	34
8/28/2002	17:20	19.1	29	59	9.69	7.21	2	0.134	0.011	0.092		0.0066	0.8	12
9/25/2002	12:15	14.1	23 J	63	9.82	7.28	1 U	0.174	0.013	0.111		0.0077	1	46

Conventional Data Report

Cowlitz R @ Kelso

26B070

Class: A
Rivermile: 4.9
Latitude: 46 08 44.0
Longitude: 122 54 47.0
Waterbody: WA-26-1040

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/31/2001	11:41	10.3	4830	121	11.01	7.52	76	0.218 J	0.01 U	0.154 J		0.0092	20	49
11/28/2001	10:55	8.4	16800	59	11.37	7.75	309 J	0.358	0.017	0.304		0.0079	20	35
		pH Recalibrated; pH=7.22 following recalibration.												
12/12/2001	10:54	7.1	14300	65	12.36	7.41	63 J	0.459	0.012	0.397		0.01	13	13
1/29/2002	17:15	4.8	17900	63	12.37	7.16	75	0.418	0.041	0.35		0.0087	23	15
2/20/2002	11:42	6	8800	75	11.24	7.34	217	0.368	0.046	0.307		0.01	37	13
3/26/2002	15:25	7.4	12600	66	12.07	7.54	85	0.351	0.025	0.286		0.0072	19	3
4/17/2002	11:20	7	15200	57	11.78	7.37	421 J	0.298	0.01 U	0.24		0.0075	130	44
5/29/2002	11:27	10.4	13300	70	10.88	7.57	377	0.126	0.019	0.084		0.012	29	100 J
6/26/2002	10:40	11.5	13100	68	10.58	7.49	36	0.109	0.012	0.076		0.0044	5.3	22 J
7/31/2002	10:20	15.5	3720	106	10.1	7.47	7	0.067	0.01 U	0.028		0.007	2.3	4 J
8/28/2002	10:18	15.8	4830	87	9.9	7.46	24	0.05	0.01 U	0.03		0.0062	2.1	15 J
9/25/2002	10:25	13.9	4600 J	87	10.13	7.38	6	0.059	0.01 U	0.032		0.0054	2	22 J

Conventional Data Report

Kalama R nr Kalama

27B070

Class: A
Rivermile: 2.8
Latitude: 46 02 51.0
Longitude: 122 50 10.0
Waterbody: WA-27-1010

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/30/2001 16:53	8.3	505	56	11.91	7.22	4	0.33 J	0.01 U	0.228 J		0.014	1.7	61
11/27/2001 16:50	6.3	1150	43	12.25	7.29	4	0.527	0.01 U	0.487		0.011	2.4	16
12/12/2001 10:20	6.1	1550	42	11.85	7.38	5	0.738	0.01 U	0.698		0.013	4.3	34
1/30/2002 11:20	4.4	1440	41	13.06	7.46	5	0.61	0.01 U	0.563		0.013	3.5	14 J
2/20/2002 10:33	5.1	1560	35	12.93	7.37	3	0.394	0.01 U	0.358		0.0093	2.5	6
3/27/2002 10:40	6.9	1280	37	12.57	7.77	3	0.431	0.01 U	0.394		0.011	1.9	7
4/17/2002 10:30	5.7	1940	36	10.79	7.53	7	0.461	0.01 U	0.421		0.01	4.2	12
5/29/2002 10:40	9.9	1410	29	11.47	7.36	25	0.154	0.01 U	0.1		0.0048	9.3 J	120
6/26/2002 10:10	14.8	310	52	10.09	7.63	3	0.114	0.015	0.062		0.01	1.4	18
7/31/2002 9:45	14.6	197	56	10.3	7.56	2	0.116	0.011	0.057		0.016	0.8	39 J
8/28/2002 9:38	15	171	61	9.9	7.52	1	0.068	0.014	0.04		0.015	0.8	43 J
9/25/2002 9:45	11.9	152	65	10.23	7.34	2	0.183	0.043	0.083		0.023	1.2	17 J

Conventional Data Report

EF Lewis R nr Dollar Corner

27D090

Class: A
Rivermile: 10.2
Latitude: 45 48 53.0
Longitude: 122 35 26.0
Waterbody: WA-27-2020

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/31/2001 10:28	9.3	1630 J	39	11.41	7.5	49	0.628 J	0.01 U	0.645 J		0.0052	14	110
TP and TPN were filtered due to high turbidity													
11/28/2001 9:55	6.9	1010 J	35	11.76	7.57	3	0.519	0.01 U	0.48		0.0054	2.9	67
12/12/2001 9:24	6.4	1230 J	32	11.85	7.24	2	0.668	0.01 U	0.621		0.0076	2.4	16 J
1/30/2002 10:20	4.1	1040 J	31	13.06	7.28	2	0.59	0.01 U	0.543		0.0057	2	7
2/20/2002 9:45	5.5	1260 J	25	12.73	7.3	2	0.326	0.01 U	0.287		0.0035	1.6	1 J
3/27/2002 9:45	7	958 J	28	12.37	7.45	1	0.359	0.01 U	0.325		0.0045	1.3	5
4/17/2002 9:51	6.1	1480 J	27	12.37	7.28	3	0.373	0.01 U	0.329		0.0055	3.2	220 J
5/29/2002 9:57	10.8	1020 J	24	10.98	7.46	11	0.211	0.01 U	0.16		0.003 U	4.8	180 J
6/26/2002 9:20	17.6	162 J	41	9.41	7.45	1	0.176	0.016	0.122		0.0046	0.6	49 J
7/31/2002 8:45	16.6	80 J	53	9.8	7.45	2	0.158	0.01 U	0.096		0.0062	0.7	55 J
8/28/2002 8:58	17.9	59 J	60	9.3	7.49	1	0.127	0.01 U	0.093		0.0057	0.7	110 J
9/25/2002 8:50	13.7	48 J	65	10.33	7.36	1 U	0.192	0.01 U	0.14		0.0062	0.6	130 J

Conventional Data Report

Gibbons Ck nr Washougal

28G070

Class: A
Rivermile: 0.5
Latitude: 45 34 30.0
Longitude: 122 18 51.0
Waterbody: WA-28-3010

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/31/2001	8:52	10		53	10.3	7.31	28	0.939 J	0.019	0.752 J		0.028	19	300 J
11/28/2001	8:15	5.9		39	11.76	7.6	267		0.019	0.514		0.02	130	1300 J
		pH Recalibrated; pH=7.30 following recalibration.												
12/12/2001	7:50	7.5		36	11.85	7.13	7	1.12	0.013	1.04		0.012	6.1	38 J
1/30/2002	8:50	5.1		23	12.47	7.11	7	0.939	0.012	0.871		0.011	5.7	46 J
2/20/2002	7:55	6.6		37	12.13	7.39	6	0.692	0.01 U	0.635		0.014	4.6	20 J
3/27/2002	7:25	7.3		33	12.17	7.11	6	0.701	0.011	0.653		0.013	5	6 J
4/17/2002	7:50	7.5		36	11.78	7.02	11	0.765	0.01 U	0.692		0.012	9.8	84 J
5/29/2002	8:26	13		50	10.09	7.51	19	0.505	0.023	0.411		0.018	11	320 J
6/26/2002	7:51	15.1		61	9.51	7.48	9	0.416	0.014	0.34		0.0342	4.7	660 J
7/31/2002	7:15	12.1		59	10.8	7.43	6	0.35	0.01 U	0.295		0.0398	3.7	410 J
8/28/2002	7:13	14.3		63	9.9	7.52	6	0.287	0.01 U	0.26		0.042	3.7	160 J
9/25/2002	7:20	11.9		70	10.43	6.98	4	0.287	0.01 U	0.226		0.0442	2.8	83 J

Conventional Data Report

Campen Cr. nr Washougal

28H070

Class: A
Rivermile: 0.6
Latitude: 45 34 39.0
Longitude: 122 18 51.0
Waterbody: WA-28-3010

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/31/2001	9:10	10.7		53	10.4	7.27	22	0.781 J	0.031	0.561 J		0.0335	25	1100 J
11/28/2001	8:35	5.4		39	11.86	6.64	78		0.041	0.348		0.02	110	1200 J
		pH Recalibrated; pH=7.26 following recalibration.												
12/12/2001	8:30	7.7		47	12.66	7.23	7	1.12	0.012	1.02		0.015	6.6	69 J
1/30/2002	9:10	5.3		45	12.27	7.1	8	0.875	0.02	0.776		0.013	6.3	75
2/20/2002	8:23	6.6		48	12.03	7.29	6	0.768	0.011	0.66		0.015	5.7	140 J
3/27/2002	7:44	7.6		43	11.58	7.21	8	0.686	0.015	0.601		0.015	6.3	32 J
4/17/2002	8:15	7.9		48	8.61	7.03	14	0.7	0.01 U	0.589		0.015	11	12 J
5/29/2002	8:45	13.9		67	9.5	7.52	11	0.597	0.031	0.439		0.024	8.6 J	620 J
6/26/2002	8:20	17.6		89	8.34	7.48	4	0.533	0.04	0.38		0.0424	4.6	250 J
7/31/2002	7:43	14.3		93	9.1	7.45	2	0.48	0.037	0.288		0.0561	3.7	92 J
8/28/2002	7:42	16.3		101	8.6	7.5	2	0.497	0.027	0.347		0.0568	4.5	290 J
9/25/2002	7:40	14.1		105	8.92	7.43	22	0.246	0.021	0.101		0.0553	7.4	160 J

Columbia R @ Umatilla

31A070

Class: A
Rivermile: 290.5
Latitude: 45 56 02.0
Longitude: 119 19 31.0
Waterbody: WA-CR-1020

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/17/2001	12:30	14.6	100400	160	10.15	8.11	4	0.227 J	0.01 UJ	0.133 J		0.0074	2.3	3
11/7/2001	13:35	12.6	122000	191	10.1	7.96	3	0.282	0.01 U	0.202		0.022	1.7	2
		Used funnel to fill BOD bottle (for last three months have collected samples directly in bottles)												
12/5/2001	12:10	8.6	339400	161	11.4	7.92	2	0.299	0.01 U	0.231		0.016	1.5	8
		Windy; water quite choppy. Workers installing underground cable below culvert.												
1/16/2002	12:35	5.8	190800	171	11.94	8.09	3	0.384	0.01 U	0.313		0.016	2.5	2
2/13/2002	15:45	3.9	177000	108 J	13.3	8.05	2	0.468	0.01 U	0.375		0.011	1.7	1 UJ
3/13/2002	13:55	4.6	136500	154	13.36	8.28	5	0.459	0.01 U	0.382		0.0068	3.4	1
4/10/2002	14:20	8.6	337700	200	12.24	8.23	7	0.796	0.013	0.646		0.014	5.3	1 U
5/15/2002	14:15	11.7	170000	127	11.41 J	8.14	5	0.253	0.01 U	0.142		0.0052	2.6	2
6/5/2002	14:00	14.3	339500	108	11.84	7.91	7	0.206	0.01 U	0.109		0.0078	3.9	2
7/17/2002	13:30	19.1	263500	132	10.4	8.43	6	0.137	0.01 U	0.029		0.0037	2.8	6
8/14/2002	13:30	20.5	161000	125	9.79	8.2	4	0.128	0.01 U	0.042		0.0045	2.4	2
9/11/2002	14:10	19.3	121400	118	8.93	8.2	4	0.211	0.01 U	0.097		0.0085	2.5	1 U

Conventional Data Report

Walla Walla R nr Touchet

32A070

Class: B
Rivermile: 15.3
Latitude: 46 02 16.0
Longitude: 118 45 55.0
Waterbody: WA-32-1010

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/17/2001	11:05	10.7	58	249	11.25	8.1	16	0.607 J	0.011 J	0.394 J		0.0665	10	110
11/7/2001	12:15	6.8	103	246	13.1	8.3	3	0.763	0.01 U	0.678		0.0743	2.8	8
12/5/2001	10:40	4.5	470	134	12.2	7.65	17	0.892	0.01 U	0.789		0.0905	9.6	32
1/16/2002	11:00	2.9	658	111	12.83	8.03	25	0.743	0.016	0.661		0.0851	9.5	18
2/13/2002	14:15	3.3	735	74.5 J	13.7	8.06	22	0.989	0.01 U	0.889		0.0751	12	15
3/13/2002	12:20	5.6	2560	70	12.24	7.63	483	0.738	0.029	0.465		0.0591	160	120 J
		severe wind. Actual stage height may be a bit lower												
4/10/2002	12:55	9.6	1280	94	10.71	7.97	93 J	0.595	0.02	0.454		0.0549	14	88
5/15/2002	12:55	14.4	865	116	10.53 J	8.39	28	0.313	0.01 U	0.158		0.0338	6.3	120
6/5/2002	12:40	19.7	623	110	9.41	8.21	30	0.369	0.021	0.193		0.05	7.7	120 J
7/17/2002	12:10	25	38	338	9.29	8.28	17	0.797	0.034	0.547		0.0894	7.2	88
		no water below normal mark. Moved one "block" over for measurement												
8/14/2002	12:10	25	11	415	10	8.44	6	0.96	0.034	0.698		0.0847	4.3	66
		No water below RP, used next column over												
9/11/2002	12:45	20.3	24	273	11.37	8.87	4	0.528	0.01 U	0.309		0.0636	3.6	23
		no water below stage marker, used next post to left												

Conventional Data Report

Snake R nr Pasco

33A050

Class: A
Rivermile: 2.2
Latitude: 46 13 00.0
Longitude: 119 01 20.0
Waterbody: WA-33-1010

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/10/2001 14:50	16.3	14400	223	8.78	8.05	4	0.316 J	0.036 J	0.12		0.0314	2.1	7
11/14/2001 16:03	11.7	19700	351	9.89	8.06	5	0.696	0.011	0.495		0.0724	2.1	4
12/5/2001 16:17	8.7	23400	319	11	8.09	3	0.667	0.01 U	0.543		0.0526	1.7	1 U
1/9/2002 15:42	5.4	45000	307 J	12.16	7.91	5	0.874 J	0.01 UJ	0.679		0.0376	1.9	1
2/6/2002 15:50	4.7	42000	308	12.92	7.99	5	1.42	0.022	1.29		0.0563	7.1	1
3/6/2002 15:07	4.7	29300	283	13.03	7.84	11	1.6	0.02	1.44		0.0438	14	1
4/3/2002 16:45	7.3	65600	264	12.6	8.26	7	1.34	0.022	1.15		0.0354	8.3	1 U
5/8/2002 15:50	11.4	80500	120	12.6	8.03	6	0.395	0.01	0.26		0.022	5.3	1 U
6/12/2002 15:01	14.1	92300	73	11.6	7.6	7	0.224	0.018	0.116		0.015	5.8	8
7/10/2002 16:30	19.4	59400	80	10.6	8.26	5	0.113	0.01 U	0.01 U		0.004	2.9	2
	Sample was taken from bridge very close to concrete bridge support because of boat traffic below.												
8/7/2002 17:45	21.8	43500	110	9.8	7.53 J	6	0.147	0.021	0.015		0.011	3.2	31
	pH was "J"ed because meter was very slow and tended to drift. It was recalibrated and checked against standard.												
9/11/2002 16:30	19.8	26000	165	8.19	8.08	5	0.269	0.029	0.131		0.026	2.7	2

Conventional Data Report

Palouse R @ Hooper

34A070

Class: B
Rivermile: 19.5
Latitude: 46 45 31.0
Longitude: 118 08 48.0
Waterbody: WA-34-1010

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/16/2001	10:20	10.3	66	407	11.15	8.71	27 J	0.772 J	0.018 J	0.36		0.003 U	5.3	31 J
11/6/2001	10:15	7.6	108	307	11	8.37	12	1.21	0.019	0.928		0.0866	7.3	35 J
12/4/2001	10:40	3.8	222	246	12.7	8.3	10	1.96	0.015	1.73		0.134 J	8.4	55
1/15/2002	10:50	3.7	838	197	13.13	7.86	24	4.48	0.029	4.23		0.103	22	32
		cattle in feedlot												
2/13/2002	12:05	1.6		147 J	10.4	8.05	28	6.67	0.037	6.33		0.136	29	13
3/13/2002	10:00	3.9	5470	150	12.65	7.61	995		0.09	4.47		0.118	650	460 J
4/10/2002	10:38	7.7	2080	113	11.53	7.75	41 J	1.99	0.032	1.78		0.0484	26	39
5/15/2002	10:20	13.9	660	169	10.14 J	9.59	4	0.858	0.01 U	0.55		0.0077	3.3	20
6/5/2002	10:15	20.1	346	147	8.9	7.87	19	1.07	0.072	0.715		0.0873	5.7	12 J
7/17/2002	9:45	23.7	80	313	7.87	8.15	11	1.02	0.034	0.69		0.101	5.4	58 J
8/14/2002	9:45	21.6	31	307	8.26	8.88	19	0.482	0.013	0.088		0.013	9.9	17
9/11/2002	10:15	16.7	36	314	8.93	8.69	16	0.776	0.019	0.46		0.021	10	19 J

Metals Data Report

Palouse R @ Hooper

34A070

Class: B
Rivermile: 19.5
Latitude: 46 45 31.0
Longitude: 118 08 48.0
Waterbody: WA-34-1010

Date/Time		Flow CFS	Hardness mg/L	Tot. Rec. Cadmium ug/L	Dissolved Cadmium ug/L	Tot. Rec. Chromium ug/L	Dissolved Chromium ug/L	Tot. Rec. Copper ug/L	Dissolved Copper ug/L	Tot. Rec. Lead ug/L	Dissolved Lead ug/L	Total Mercury ug/L	Dissolved Nickle ug/L	Tot. Rec. Arsenic ug/L	Tot. Rec. Zinc ug/L	Dissolved Zinc ug/L
11/6/2001	10:15		111													
1/15/2002	10:50		78.5													
3/13/2002	10:00		70													
5/15/2002	10:20		65													

Conventional Data Report

Palouse R at Colfax

34A120

Class: A
Rivermile: 90.2
Latitude: 46 53 45.0
Longitude: 117 21 34.0
Waterbody:

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/16/2001 9:10	9		130	9.84	8.03	26	0.275 J	0.022 J	0.01 U		0.003 U	20	350 J
Flow just out of center channel (lapping left bank). Backhoe digging along right bank (and in water) 100M upstream.													
11/6/2001 9:10	4.6		93	11.3	8.28	2	0.15	0.01 U	0.01 U		0.0092	2.6	20 J
12/4/2001 9:30	0.1		119	13.1	7.69	3	1.36	0.01 U	1.19		0.027 J	7	37
Windy. Stage an estimate													
1/15/2002 9:25	0.7		79	12.83	8.27	5	2.12	0.014	1.91		0.0511	20	35
2/12/2002 13:30	1		88.8 J	13.7	8.34	7	5.37	0.027	5.08		0.0911	22	14
3/12/2002 12:00			88	12.34	7.42	794		0.068	3.53		0.119	450	700 J
water very fast, thermoprobe would not submerge													
4/9/2002 12:40	6.6		45	11.63	8.08	36	0.611	0.023	0.461		0.027	24	20
5/13/2002 12:25	13.6		53	12.39 J	9.59	5	0.213	0.01 U	0.042		0.009	6.3	1
6/4/2002 12:20	18.1		49	10.42	9.12	9	0.221	0.016	0.055		0.016	5	14
7/16/2002 12:25	23.8		88	7.37	8.88	5	0.284	0.015	0.01 U		0.018	3.4	96
8/13/2002 11:50	19.6		123	7.04	8.27	10	0.349	0.022	0.01 U		0.0071	6.6	61
9/10/2002 12:40	16.5		121	8.32	8.83	4	0.266	0.011	0.01 U		0.0065	3.2	45

Conventional Data Report

Palouse R @ Palouse

34A170

Class: A
Rivermile: 121.2
Latitude: 46 54 33.0
Longitude: 117 04 33.0
Waterbody: WA-34-1030

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/16/2001 12:00	8.7	47 J	71	10.35	8.21	2	0.172 J	0.01 UJ	0.01 U		0.01	1.8	110
11/6/2001 11:55	4.3	26 J	70	11.2	7.94	1	0.172	0.01 U	0.01 U		0.014	4.7	12
12/4/2001 12:10	0.5	80 J	94	13	7.49	2	1.28	0.01 U	1.15		0.029	10	57
1/15/2002 12:20	1	0	58	12.53	8.14	6	0.935	0.028	0.74		0.037	19	82
2/12/2002 14:35	0.9	209 J	55.2 J	13.2	7.77	6	2.73	0.034	2.28		0.0654	21	23
3/12/2002 13:25	2.1	4260 J	57	12.14	7.1	208		0.033	1.41		0.0854	150	240 J
	Water very high!												
4/9/2002 13:35	4.7	1720 J	33	11.63	7.38	40 J	0.229	0.022	0.107		0.024	22	23
5/13/2002 13:45	12.1	428 J	34	10.14 J	7.72	9	0.185	0.01 U	0.034		0.019	8.2	32
6/4/2002 13:20	16.8	205 J	36	10.02	8.08	4	0.115	0.01 U	0.01 U		0.014	4.8	22
7/16/2002 13:50	26.2	20 J	67	9.59	8.37	2	0.252	0.011	0.01 U		0.021	1.5	56
8/13/2002 12:55	20.8	6 J	81	9.79	8.69	3	0.266	0.01 U	0.01 U		0.0073	1.4	31
9/10/2002 13:50	17	5 J	75	9.44	8.69	1 U	0.22	0.01 U	0.01 U		0.005	2.9	98

Conventional Data Report

SF Palouse R @ Pullman

34B110

Class: A
Rivermile: 22.2
Latitude: 46 43 58.0
Longitude: 117 10 48.0
Waterbody: WA-34-1020

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/16/2001 12:40	10.2	5.7 J	544	8.34	7.55	3	8.88 J	1.97 J	6.6		1.32	2.1	14
11/6/2001 12:40	6.9	4.9	548	10.6	8.02	1	6.01	0.01 U	6.11		1.43	1.9	17
12/4/2001 12:50	3	21	389	11.8	7.72	8	3.15	0.028	2.79		0.203	26	170
1/15/2002 13:10	1.2	32	273	12.63	7.67	8	5.82	0.028	5.75		0.249	21	57
2/12/2002 15:20	1.8	55	164 J	12.9	7.73	12	8.79	0.04	8.24		0.186	29	230
3/12/2002 14:05	4	390	160	11.93	7.53	470		0.054	5.94		0.155	340	500
checkbar 16.66													
4/9/2002 14:20	8.9	62	207	11.22	7.93	15 J	4.27	0.014	4.02		0.0971	24	420 J
check bar 16.66; wwg 2.11													
5/13/2002 14:25	15.4	21	282	12.48 J	8.97	5	2.62	0.01 U	1.81		0.0731	5.7	60
Ck Bar 16.66, wwg 1.51													
6/4/2002 14:00	18.7	12	307	10.22	8.29	9	1.42	0.031	1.14		0.584	5.6	470
7/16/2002 14:30	22	4.4	530	9.19	8.19	5	0.943	0.044	0.632		0.756	2.8	300
WWG 0.74, checkbar 16.66													
8/13/2002 14:00	17.5	4.5	646	10.61	8.28	4	1.34	0.03	0.761		0.484	2.2	300
9/10/2002 14:45	14.9	4.8	574	9.74	8.33	2	1.95	0.011	1.5		0.538	1	110

Conventional Data Report

Pleasant Valley Cr blw St John

34H070

Class: A
Rivermile:
Latitude: 47 06 19.0
Longitude: 117 37 48.0
Waterbody:

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/16/2001 8:05	7.8		470	9.24	7.78	39	5.91 J	0.01 UJ	5.36		0.277	2.9	35 J
11/6/2001 8:15	6.4		461	10.1	7.97	51	5.47	0.01 U	5.61		0.305	2.2	6 J
12/4/2001 8:30	3.5		416	10.6	7.31	7	5.14	0.014	4.92		0.246 J	4	37
	3" fresh snow.												
1/15/2002 8:15	2.5		415	11.54	8.11	34	5.91	0.068	5.83		0.158	17	360 J
2/12/2002 12:35	3		254 J	12.7	8.1	85	6.71	0.043	6.26		0.162	31	23
3/12/2002 11:05	5.2		386	11.22	8.01	617		0.077	5.53		0.174	380	920
4/9/2002 11:42	8.5		461	13.16	8.47	13	6.54	0.017	6.67		0.0855	5.1	26
5/13/2002 11:30	14.1		388	13.65 J	8.75	24	5.12	0.01 U	4.87		0.0714	2.8	2
6/4/2002 11:10	16.8		406	13.76	8.56	12	5.11	0.027	5.24		0.162	3.6	41
7/16/2002 11:15	19.2		385	14.04	8.95	6	5.02	0.019	4.87		0.251 J	3.2	36
8/13/2002 10:45	17		458	13.26	8.67	6	5.87	0.027	5.37		0.295	2.8	71
	Lots of plant growth since last month												
9/10/2002 11:25	15.6		401	10.55	8.45	19	5.21	0.026	5.05		0.293	0.8	110
	a lot of aquatic plant growth												

Conventional Data Report

Snake R @ Interstate Br

35A150

Class: A
Rivermile: 139.6
Latitude: 46 25 15.0
Longitude: 117 02 05.0
Waterbody: WA-35-1020

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/16/2001 13:40	14.9	13300	391	9.74	8.27	4	0.786 J	0.01 UJ	0.583		0.0583	1.9	4
11/6/2001 13:40	11.3	12900	364	10.19	8.25	5	0.791	0.01 U	0.664		0.0623	2.9	1
12/4/2001 13:55	6.7	14000	367	11.7	8.27	3	0.888	0.01 U	0.776		0.0476	1.6	1 U
1/15/2002 14:20	4	19900	344	12.43	8.15	3	1.13	0.018	1.04		0.0456	2.4	1 U
2/13/2002 7:10	2.6	25700	227 J	13.6	8.55	3	1.42	0.01 U	1.26		0.0407	1.4	1 J
pH meter 7.09 not 7.03													
3/13/2002 6:35	4.9	27000	340	12.75	8.49	8	1.12	0.01 U	0.973		0.0319	5.4	2 J
4/10/2002 7:20	8.6	39900	206	11.22	8.28	22 J	0.732	0.025	0.505		0.03	11	11 J
5/15/2002 6:40	12.3	31300	142	9.95 J	7.82	8	0.371	0.01 U	0.219		0.025	3.1	14 J
6/5/2002 6:40	13.2	74500	96	10.22	7.87	51	0.307	0.045	0.143		0.019	14	25 J
7/17/2002 6:15	22.3	17300	198	8.78	8.1	4	0.316	0.011	0.145		0.018	1.5	4 J
bridge painting in progress. New monitoring equipment (salmon transponders?) mounted on bridge													
8/14/2002 6:15	21.3	14400	262	8.97	8.4	5	0.461	0.014	0.256		0.0407	2.2	5 J
9/11/2002 6:50	20.1	12700	271	9.44	8.75	4	0.455	0.01 U	0.291		0.039	1.8	1 J

Conventional Data Report

Tucannon R @ Powers

35B060

Class: A
Rivermile: 2.3
Latitude: 46 32 16.0
Longitude: 118 09 16.0
Waterbody: WA-35-2010

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/17/2001 9:00	10.3	74	159	11.25	7.9	3	0.198 J	0.01 UJ	0.129 J		0.0327	1.1	80 J
11/7/2001 10:00	6.3	89	154	12.6	8.21	4	0.212	0.01 U	0.169		0.0428	1.5	220
12/5/2001 8:40	6.1	104	137	11.7	7.76	7	0.344	0.01 U	0.289		0.0484	1.5	84 J
1/16/2002 9:10	3.6	144	115	12.63	7.83	11	0.401	0.01 U	0.329		0.0531	4.1	160 J
cows in stream													
2/13/2002 11:45	3.7	132	81.7 J	13	7.95	7	0.499	0.01 U	0.403		0.0507	2.9	9
3/13/2002 8:50	5.9	258	108	12.04	7.82	56	0.66	0.014	0.448		0.0723	39	180 J
4/10/2002 9:33	9.5	252	108	11.53	7.9	15 J	0.286	0.01	0.152		0.0347	6.1	31 J
cattle in creek below station													
5/15/2002 9:10	11.4	223	100	10.82 J	7.92	13	0.148	0.01 U	0.01		0.0323	3.3	72
6/5/2002 9:10	14.6	301	76	9.91	7.77	23	0.218	0.014	0.112		0.0366	5.8	130 J
7/17/2002 8:40	20.1	72	145	8.98	7.83	5	0.279	0.018	0.168		0.057	2.1	160 J
8/14/2002 8:40	18.2	58	152	9.28	7.8	4	0.197	0.01 U	0.111		0.0491	1	100
9/11/2002 9:00	14.7	55	143	10.05	7.95	2	0.221	0.01 U	0.155		0.0442	0.9	48

Conventional Data Report

Asotin Cr @ Asotin

35D070

Class: A
Rivermile: 0.4
Latitude: 46 20 27.0
Longitude: 117 03 18.0
Waterbody:

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/16/2001	14:10	11.9	40	135	10.85	8.21	4	0.092 J	0.01 UJ	0.035		0.0462	1.3	51
11/6/2001	14:15	7.7	43	133	11.6	8.18	2	0.071	0.01 U	0.025		0.0456	1	8
12/4/2001	14:30	5.7	46	120	12.5	8.35	5	0.175	0.01 U	0.126		0.055	1.7	5
1/15/2002	15:00	3.9	80	104	12.73	8.33	9	0.282	0.01 U	0.191		0.0605	5	29
2/13/2002	7:40	1.7	44	69.2 J	13.9	8.34	3	0.282	0.01 U	0.22		0.0589	1.3	59 J
3/12/2002	15:30	7	254	94	11.73	7.87	73	1.12	0.015	0.768		0.117	65	220
4/9/2002	15:40	9.2	200	81	11.32	8.03	15 J	0.23	0.014	0.06		0.0589	12	23
5/13/2002	15:55	13.5	129	75	9.85 J	8.15	7	0.123	0.01 U	0.01 U		0.0552	4	170 J
6/4/2002	15:20	15	146	63	10.12	7.85	11	0.105	0.01 U	0.014		0.0454	4.2	60
7/16/2002	16:50	23.8	47	120	8.58	8.83	6	0.129	0.014	0.03		0.0589	2	140
8/13/2002	15:15	21.9	36	118	9.89	8.76	7	0.117	0.01 U	0.024		0.061	1.7	61
9/10/2002	16:10	18.2	38	110	9.84	8.84	6	0.103	0.01 U	0.041		0.0534	2.6	41

city? Crew cutting weeds and grass along creek. Large amount of cut plants floating downstream

Conventional Data Report

Pataha Cr @ Rosy Grade

35F110

Class: A
Rivermile: 40.2
Latitude: 46 21 41.0
Longitude: 117 33 19.0
Waterbody:

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/17/2001	7:50	3.8		87	11.35	7.93	2	0.08 J	0.01 UJ	0.01 UJ		0.059	1.9	120 J
11/7/2001	7:55	0		90	13	8.02	3	0.103	0.01 U	0.01 U		0.0646	1.5	130 J
		Skin of ice on surface.												
1/16/2002	8:00	0.1		83	12.33 J	7.56	3	0.358	0.016	0.227		0.065	10	100 J
		DO titration overshot endpoint, backtitrated but value estimated												
2/13/2002	9:40	0.3		57.2 J	13	7.9	7	0.7	0.01 U	0.564		0.0742	4.6	23 J
3/13/2002	7:45	1.1		106	13.06	7.78	87	1.31	0.01 U	1.05		0.0911	50	140
4/10/2002	8:20	3.4		80	11.93	8.23	21 J	0.665	0.01 U	0.492		0.0582	17	26 J
5/15/2002	8:00	4.4		57	11.21 J	7.71	11	0.186	0.01 U	0.095		0.0349	5.8	43 J
6/5/2002	8:00	9.3		56	10.22	8.03	8	0.179	0.011	0.09		0.0386	5	33 J
7/17/2002	7:25	15.1		84	8.58	8	2	0.171	0.042	0.021		0.0737	2.8	600 J
8/14/2002	7:25	17.8		83	9.08	7.89	5	0.104	0.01 U	0.015		0.0716	2.6	1000 J
9/11/2002	7:50	8.7		72	10.25	7.92	1	0.078	0.01 U	0.011		0.0605	1.6	140 J

Conventional Data Report

Columbia R nr Vernita

36A070

Class: A
Rivermile: 388.1
Latitude: 46 38 30.0
Longitude: 119 43 50.0
Waterbody: WA-CR-1030

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/10/2001 13:35	16	74900	140	9.59	7.71	2	0.165 J	0.01 UJ	0.089		0.0031	0.8	1 U
11/14/2001 13:29	12.4	40500	140	10.3	8.24	1	0.18	0.01 U	0.101		0.0068	0.6	2
12/5/2001 13:15	9.6	89700	141	10.8	8.12	2	0.153	0.01 U	0.107		0.0057	0.7	1 U
1/9/2002 13:12	6.9	60400	139 J	11.95	7.61	1	0.212 J	0.01 UJ	0.13		0.0045	0.7	1
2/6/2002 13:20	4	60000	137	13.23	7.97	1	0.233	0.01 U	0.176		0.003 UJ	0.7	1 U
3/6/2002 12:30	4.1	59400	143	14.14	8.26	2	0.235	0.01 U	0.171		0.003 U	1	1 U
4/3/2002 12:10	6.5	51600	145	14	8.44	3	0.243	0.01 U	0.174		0.003 U	1.2	1 U
5/8/2002 13:10	9.2	126000	134	14	8.26	4	0.22	0.01 U	0.121		0.003 U	1.8	1
6/12/2002 12:18	12.5	228000	117	13	8.31	5	0.155	0.015	0.074		0.0033	3	1
7/10/2002 14:01	16.6	234000	117	11.8	8.17	3	0.126	0.01 U	0.05		0.003 U	1.6	1 U
8/7/2002 15:01	18.5	111000	120	10.8	8.15 J	3	0.128	0.01 U	0.055		0.003 U	1.4	1 U
	pH "J"ed because of difficulty in calibrating meter during successive sampling events. The meter was checked against standards after this event with satifactory results but did not go through a full calibration.												
9/11/2002 13:50	19.2	47300	123	9.4	8.15	1	0.119	0.01 U	0.073		0.0055	0.8	1

Conventional Data Report

Yakima R @ Kiona

37A090

Class: A
Rivermile: 29.8
Latitude: 46 15 11.0
Longitude: 119 28 27.0
Waterbody: WA-37-1010

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/10/2001 15:55	12.2	941	303	11.71	8.4	6	1.4 J	0.01 J	1.18		0.105	2.9	2
11/14/2001 15:04	8.8	1660	256	12.62	8.37	13	1.33	0.01 U	1.16		0.091	4.6	5
12/5/2001 15:05	5	2480	221	13.7	8.34	8	1.2	0.012	1.1		0.0937	4.4	21
1/9/2002 14:30	5.6	9330	117 J	12.16	7.67	379		0.082 J	0.427		0.0419	170	130
Water very turbid and running high.													
2/6/2002 14:52	3.7	2480	207	13.33	8.06	7	1.08	0.04	0.962		0.0856	3.8	6
3/6/2002 14:03	5.7	3410	171	12.92	7.96	18	0.687	0.024	0.593		0.0617	7.4	12
4/3/2002 15:05	12	3650	159	12.4	8.45	35	0.464	0.019	0.319		0.0583	13	20 J
Barometric pressure is averaged using 12:41 pst and 17:08 pst reports from Pasco airport.													
5/8/2002 14:37	12.9	3190	155	12.8	8.56	11	0.549	0.01 U	0.448		0.062	6.8	3
pH meter calibration checked with 6.95 standard but not recalibrated.													
6/12/2002 13:50	17.6	6280	121	9.6	7.74	57	0.53	0.02	0.432		0.0502	18	32
7/10/2002 15:27	24.9	1800	206	13	8.83	9	0.819	0.024	0.618		0.0316	4.8	10
8/7/2002 16:20	22	1400	219	11	8.55 J	9	1.06	0.029	0.885		0.112	3.2	8
pH was "J"ed because meter would not calibrate with a slope within parameters (89.2%). The meter was checked against a standard with good result.													
9/11/2002 15:10	20.4	1460	241	11.9	8.77 J	4	1.12	0.013	0.942		0.102	2.2	6
pH meter was recalibrated with a slope of 90.7. Meter responded well to standards.													

Conventional Data Report

Yakima R @ Nob Hill

37A205

Class: A
Rivermile: 111.3
Latitude: 46 34 54.0
Longitude: 120 27 38.0
Waterbody: WA-37-1040

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/8/2001 14:40	13.3	1870	116	13.63	8.99	4	0.134 J	0.01 UJ	0.059		0.03	2.3	33
11/12/2001 10:35	5.2	1040	135	13.63	7.82	3	0.238	0.01 U	0.139		0.02	1.4	5
12/3/2001 11:15	3.7	1380	127	13.8	7.83 J	3	0.285	0.01 U	0.223		0.024	2.3	9
pH meter recalibrated after initial analysis and second analysis was questionable because of temperature change.													
1/7/2002 11:12	3.9	1190	129 J	13.26	8.11 J	5	0.338 J	0.014 J	0.259		0.018	2.1	6
pH re-analized after recalibration but result is questionable because of temperature/meter drift.													
2/4/2002 11:17	2.2	1870	115	14.04	7.89	4	0.335	0.01 U	0.258		0.0312	1.8	1
Good calibration at this site after questionable pH readings earlier in the morning.													
3/4/2002 11:30	4.9	2500	110	13.93	8.09	4	0.217	0.014	0.138		0.012	2.6	3
4/1/2002 11:34	8.3	2920	104	12.5	8.11	12	0.156	0.013	0.036		0.013	7.6	8
5/6/2002 11:52	7.9	4860	90	12.4	7.73	10	0.209	0.01 U	0.111		0.019	5.5	12
6/10/2002 12:20	12.4	8370	73	10.8	7.69	18	0.159	0.01	0.093		0.014	8.5	37
7/8/2002 10:11	16.6	4160	74	10.19	8.19	6	0.215	0.01 U	0.138		0.013	3.2	45
8/5/2002 11:30	14.6	3830	76	10.7	7.98	7	0.214	0.01	0.137		0.018	2.9	23 J
9/9/2002 11:45	15.1	2830	89	10.8	8.2	12	0.172	0.01 U	0.108		0.0322	5.6	27

Conventional Data Report

Wide Hollow Creek @ Randall Park

37E120

Class: A
Rivermile:
Latitude: 46 34 45.0
Longitude: 120 34 16.0
Waterbody: WA-37-1047

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/8/2001 15:58	12.7	34	157	10.6	7.76	19	0.519 J	0.01 UJ	0.4		0.0405	6.3	580
11/12/2001 9:25	6.7	1.6	556	9.79	7.11 J	3	2.68	0.01 U	2.38		0.022	2.3	4500 J
pH meter recalibrated after sampling. Shallow water on d/s side of bridge. Sample taken on u/s side. Resident ducks observed in pool on u/s side of bridge.													
12/3/2001 8:56	5.9	2.4	473	9.6	7.49	12	2.29	0.038	2.03		0.193	13	830 J
1/7/2002 9:32	7.4	3	506 J	10.35	7.57	4	2.74 J	0.023 J	2.35		0.201	4	160 J
2/4/2002 10:15	4.8	1.8	532	12.82	7.84 J	14	2.78	0.01 U	2.54		0.205	4.5	180 J
Could not precisely calibrate pH meter (7.00/7.18). Samples are taken from a bridge over an area of the creek where the water is backed up behind debris and a rock sill. Resident ducks are present in the pool and fecal matter is visible in the water.													
3/4/2002 10:20	6.9	2.1	536	14.74	8.2 J	3	2.57	0.012	2.34		0.178	1.9 J	140 J
pH meter recalibrated after initial reading and sample remeasured. "J" result because of warming of sample during recalibration. Domestic ducks present at this site.													
4/1/2002 10:28	9.5	13	188	14.2	7.72	3	0.576	0.01 U	0.415		0.0411	3.2	27
Ducks observed in water above sampling site.													
5/6/2002 10:55	7.8	23	136	12.8	6.86	7	0.34	0.01 U	0.233		0.022	4	120
pH meter recalibrated													
6/10/2002 11:25	12.8	17	144	10.19	7.55	8	0.482	0.026	0.382		0.0308	5.5	260
7/8/2002 9:23	16.8	14	199	9.3	7.77	6	0.773	0.012	0.642		0.0565	3.7	240
Domestic ducks in the creek just above the sampling site.													
8/5/2002 10:40	15.3	11	187	9.9	7.64	8	0.72	0.011	0.616		0.0601	3.7	610 J
9/9/2002 10:52	14.1	15	195	9.8	7.69 J	11	0.809	0.01 U	0.649		0.0607	6.2	1100

Conventional Data Report

Ahtanum Cr. @ 62nd Ave

37G120

Class: A
Rivermile:
Latitude: 46 32 54.0
Longitude: 120 35 29.0
Waterbody: WA-37-2000

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/8/2001	15:32	11.8	5.1	203	11.11	8.18	7	0.171 J	0.01 UJ	0.052		0.0759	3	310
11/12/2001	8:55	5.2	16	157	11.81	7.04	5	0.116	0.01 U	0.03		0.0668	2.2	40 J
12/3/2001	8:15	3.2	20	144	12.2	7.79	8	0.141	0.01 U	0.063		0.0716	3.3	100 J
1/7/2002	9:00	4	26	138 J	12.26	6.93	9	0.178 J	0.013 J	0.088		0.0606	3.8	170 J
2/4/2002	9:11	1.1	22	152	13.73	7.43 J	4	0.293	0.01 U	0.202		0.0632	2.6	34
		pH meter calibration was not checked at this site and the meter would not calibrate at the following site therefore this pH value is given a "J".												
3/4/2002	9:25	3.5	37	130	13.43	7.56	9	0.204	0.01 U	0.101		0.043	4.4	100 J
4/1/2002	9:45	7.1	54	110	12.1	7.52	37	0.159	0.013	0.02		0.0406	15	180
5/6/2002	10:25	6.7	66	94	12	7.21	16	0.148	0.01 U	0.036		0.03	5.6	79
6/10/2002	10:59	11.3	76	83	10.7	7.72	26	0.132	0.01	0.048		0.0336	8.5	260
7/8/2002	8:55	16.3	14	175	9.9	7.96	3	0.276	0.021	0.116		0.066	2.1	680
8/5/2002	10:20	13.3	18	160	11	7.85	4	0.201	0.01 U	0.09		0.0655	2	140 J
9/9/2002	10:05	12.8	18	132	10.7	7.97	8	0.108	0.01 U	0.027		0.0578	3.5	210
		Slight turbidity. Some foam visible on surface.												

Conventional Data Report

Naches R @ Yakima on US HWY 97

38A050

Class: A
Rivermile: 0.1
Latitude: 46 37 48.0
Longitude: 120 30 52.0
Waterbody: WA-38-1010

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/8/2001 12:30	13.5	1440	89	11.61	8.52	5	0.099 J	0.01 UJ	0.043		0.0069	3.3	4
11/12/2001 11:20	5.7	247	110	14.04	8.02	4	0.184	0.01 U	0.122		0.01	1.1	2
12/3/2001 10:15	3	483	94	13.9	7.75	3	0.173	0.01 U	0.135		0.012	1.9	9 J
1/7/2002 11:55	3.6	1030	90 J	13.66	7.33	5 J	0.185 J	0.01 UJ	0.135		0.012	2	13
2/4/2002 11:54	2	609	83	14.14	7.59	3	0.157	0.01 U	0.109		0.01	1.9	1 U
3/4/2002 12:05	3.3	1200	81	14.74	8.43	3	0.071	0.01 U	0.014		0.0083	2.6	2
4/1/2002 12:20	7.7	1190	84	12.9	8.3	10	0.095	0.015	0.012		0.015	6.6	1
5/6/2002 12:32	6.5	2960	64	12.7	7.69	8	0.072	0.01 U	0.014		0.011	4.7	1
6/10/2002 13:10	12.1	4600											
8/5/2002 12:00		496			8								

This was a metals only station however pH was also taken. No other data was collected.

Metals Data Report

Naches R @ Yakima on US HWY 97

38A050

Class: A
Rivermile: 0.1
Latitude: 46 37 48.0
Longitude: 120 30 52.0
Waterbody: WA-38-1010

Date/Time		Flow CFS	Hardness mg/L	Tot. Rec. Cadmium ug/L	Dissolved Cadmium ug/L	Tot. Rec. Chromium ug/L	Dissolved Chromium ug/L	Tot. Rec. Copper ug/L	Dissolved Copper ug/L	Tot. Rec. Lead ug/L	Dissolved Lead ug/L	Total Mercury ug/L	Dissolved Nickle ug/L	Tot. Rec. Arsenic ug/L	Tot. Rec. Zinc ug/L	Dissolved Zinc ug/L
10/8/2001	12:30		36.3	0.1 U	0.02 U	0.5 U	0.12	0.8	0.49	0.1 U	0.02 U	0.002 U	0.29	0.61	1.1	0.95
12/3/2001	10:15		36.8	0.1 U	0.02 U	0.5 U	0.25 U	1.1 J	0.4	0.13	0.02 U	0.002 U	0.1 U	0.39	2.1 J	5.8
2/4/2002	11:54		36.1	0.1 U	0.02 U	0.5 U	0.24	1.4 J	0.38	0.1 U	0.02 U	0.004 U	0.19	0.32	1.7	3.6
4/1/2002	12:20		35.4	0.1 U	0.1 U	0.5 U	0.5 U	1.12	0.52	0.17	0.1 U	0.0032	0.32	0.37	2.2	1.4
6/10/2002	13:10		24.3	0.1 U	0.025	0.53	0.25 U	1.38	0.55	0.41	0.02 U	0.0038	0.3	0.35	6	2.4
8/5/2002	12:00		34.7	0.1 U	0.02 U	0.5 U	0.25 U	0.76	0.44	0.13	0.02 U	0.002 U	0.23	0.41	5 U	1.3

Conventional Data Report

Cowiche Cr. @ Zimmerman rd

38G120

Class: A
Rivermile:
Latitude: 46 38 10.0
Longitude: 120 39 55.0
Waterbody:

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/8/2001	16:35	13.3	2.4	387	11.31	8.67	3	0.96 J	0.01 UJ	0.69		0.0842	1.7	900
11/12/2001	8:00	5.6	7.2	349	11.21	7.34	2	0.842	0.01 U	0.666		0.0635	1.1	50 J
		Barometric pressure for this station back calculated after setting barometer at Yakima airport at approx. 08:45.												
12/3/2001	7:01	4	15	293	11.6	7.79	3	0.804	0.011	0.641		0.0758	2.1	21 J
1/7/2002	8:25	4.6	18	272 J	11.55	7.76	7	0.873 J	0.045 J	0.645		0.0689	3	33 J
2/4/2002	8:25	0.8	12	227	14.04	7.49	5	0.612	0.01 U	0.473		0.0527	2.8	17 J
		Outside air temperature (OAT) 1.6 degrees C.												
3/4/2002	8:50	2.8	35	165	13.93	7.6	4	0.421	0.01 U	0.266		0.0377	2.9	110 J
4/1/2002	9:00	5.9	128 J	118	12.5	7.32	32	0.229	0.01 U	0.06		0.0442	13	56 J
5/6/2002	9:27	5.5	74	112	12.9	7.51	8	0.258	0.01 U	0.112		0.026	4.3	87 J
6/10/2002	10:10	11.5	83	104	10.6	7.62	25	0.249	0.012	0.139		0.0318	9.7	420
7/8/2002	7:50	15.1	12	199	9.6	7.72	10	0.574	0.019	0.393		0.0578	5.5	830 J
		Cattle were observed in the pasture adjoining the creek just upstream of the sampling site.												
8/5/2002	9:26	13.1	31	137	10	7.58	55	0.423	0.011	0.248		0.0682	20	3000 J
		Water appeared turbid. Observation approximately 3 hours later did not reveal excessive turbidity.												
9/9/2002	9:22	11.5	8.8	338	9.69	7.68	4	1.09	0.019	0.864		0.0918	2.5	2500

Conventional Data Report

Yakima R @ Harrison Bridge

39A050

Class: A
Rivermile: 122
Latitude: 46 40 47.0
Longitude: 120 29 24.0
Waterbody: WA-39-1010

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/8/2001	12:10	10.3	550 J	157	14.04	8.98	5	0.319 J	0.01 UJ	0.183		0.016	1.4	6
11/12/2001	12:10	5.5	416 J	130	14.14	8.45 J	3	0.181	0.01 U	0.097		0.012	1.1	2
		pH meter recalibrated after reading meter and data entry.												
12/3/2001	12:10	4.1	434 J	139	14.4	8.59 J	4	0.281	0.01 U	0.217		0.017	1.8	1
		Ph meter recalibrated after initial analysis. Second analysis gave questionable results.												
1/7/2002	12:25	4	465 J	145 J	13.56	8.4 J	5	0.384 J	0.02 J	0.28		0.021	2	1
		pH re-analized after recalibration. Result questionable because of changing temperature and meter drift.												
2/4/2002	12:50	3	425 J	126	14.44	7.53	4	0.303	0.014	0.22		0.017	1.6	1 U
3/4/2002	12:35	4.9	441 J	128	14.24	8.27	5	0.265	0.014	0.161		0.012	2.8	1 U
4/1/2002	13:05	9.3	738 J	113	12.7	8.17	15	0.178	0.015	0.036		0.0096	8.2	2
5/6/2002	13:06	9.8	938 J	121	13.4	8.44	9	0.386	0.012	0.251		0.0324	5.5	8

Conventional Data Report

Yakima R nr Cle Elum

39A090

Class: AA
Rivermile: 191
Latitude: 47 11 10.0
Longitude: 121 02 30.0
Waterbody: WA-39-1060

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/8/2001	10:05	10.8	288 J	57	10.4	7.72	2	0.052 J	0.01 UJ	0.012		0.011	1.2	16 J
11/12/2001	13:43	6	233 J	63	12.12	7.49	1 U	0.03	0.01 U	0.01 U		0.0044	0.6	2
12/3/2001	14:10	4.5	396 J	66	13.3	7.64	2	0.042	0.01 U	0.012		0.0056	0.7	1
		See entry in General Comments for the run.												
1/7/2002	14:12	3.5	510 J	65 J	12.76	7.14 J	5	0.066 J	0.01 UJ	0.04		0.0043	1.4	6
		pH meter would not calibrate.												
2/4/2002	14:35	3.2	415 J	70	13.43	7.83	1	0.066	0.01 U	0.029		0.0049	0.6	1 U
		Samples taken from new site on abandoned RR tressel 100 meters d/s from old site.												
3/4/2002	14:00	4.6	509 J	71	13.43	8.23	1	0.064	0.01 U	0.022		0.0033	0.7	1 U
		Sample taken from abandoned RR tressel approx. 100 meters downstream from original highway bridge site.												
4/1/2002	14:45	6.3	950 J	70	13.4	7.95	3	0.052	0.01 U	0.01 U		0.0033	1.2	1 U
		Samples taken from new site on abandoned RR tressel 100 meters d/s from old highway bridge site.												
5/6/2002	14:45	6.7	950 J	61	12.1	6.95	3	0.053	0.01 U	0.016		0.0038	1.8	1 U
		pH meter recalibrated.												
6/10/2002	14:45	12.2	820 J	51	11	7.67	3	0.032	0.01 U	0.01 U		0.0037	1.7	1 U
7/8/2002	14:02	12.2	980 J	40	10.5	8.19	4	0.046	0.01 U	0.01 U		0.003 U	1.6	6
8/5/2002	13:35	16.3	980 J	42	9.5	7.62 J	2	0.051	0.01 U	0.01 U		0.0031	1	1
		pH was not recorded during ambient sampling. The ph indicated is estimated from a QA sample taken 20 minutes after ambient sampling event.												
9/9/2002	13:20	16.7	544 J	54	9.7	7.92	2	0.037	0.01 U	0.01 U		0.0052	0.6	3
		Station and field data added manually by dh 4Nov02.												

Conventional Data Report

Crab Cr nr Beverly

41A070

Class: B
Rivermile: 6
Latitude: 46 49 53.0
Longitude: 119 48 54.0
Waterbody: WA-41-1010

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/10/2001 12:35	10.9	316	566	10.6	8.15	17	1.72 J	0.01 UJ	1.35		0.0317	4.1	290
11/14/2001 12:12	10	219	759	11.41	8.5	13	2.54	0.01 U	2.14		0.0376	4.3	54
pH meter recalibrated and sample measured at 8.5 after recalibration.													
12/5/2001 12:12	4.3	217	868	12.3	8.34	8	2.96	0.021	2.48		0.0661	5.9	34
1/9/2002 11:27	5.3	192	804 J	11.85	8.55	12	3.3 J	0.04 J	2.7		0.0699	6.8	14
2/6/2002 12:15	2.9	199	756	13.33	8.36	23	3.15	0.033	2.92		0.0512	14	14
3/6/2002 11:23	5.5	153	754	12.62	8.35	21	3.02	0.026	2.7		0.0519	12	17
pH meter recalibrated after initial reading and sample remeasured.													
4/3/2002 11:05	9.7	215	620	12.2	8.45	43	2.86	0.019	0.982		0.025	20	140
5/8/2002 12:05	11.6	283	488	11.1	8.37	58	1.23	0.01 U	0.949		0.02	17	40
6/12/2002 11:15	20.9	202	508	9.4	8.24	53	1.49	0.018	1.24		0.014	17	120
Water appears turbid.													
7/10/2002 12:25	23.1	209	467	10.1	8.45	68	1.29	0.018	0.975		0.0074	23	54
Water turbid.													
8/7/2002 13:40	20.3	204	496	11.5	8.7	58	1.71	0.012	1.33		0.011	17	130
9/11/2002 12:41	19	328	508	9.5	8.24	16	1.36	0.01 U	1.03		0.0301	5.7	92
Water appears turbid.													

Conventional Data Report

Wenatchee R @ Wenatchee

45A070

Class: A
Rivermile: 1.1
Latitude: 47 27 32.0
Longitude: 120 20 07.0
Waterbody: WA-45-1010

Date/Time	Temp deg. C	Flow CFS	Conductivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbidity NTU	Fecal Coliforms #/100/mL
10/10/2001 10:15	8.8	253	121	12.12	7.19	2	0.45 J	0.01 UJ	0.345		0.0038	0.7	11
11/14/2001 9:43	7	1340	62	12.22	7.31	3	0.188	0.01 U	0.116		0.0037	1.2	22 J
12/5/2001 9:45	2.8	1540	59	13.3	7.02	2	0.185	0.01 U	0.142		0.0039	0.6	12 J
1/9/2002 9:10	3.3	7360	41 J	13.56	7.35 J	36	0.167 J	0.011 J	0.069		0.0032	6.7	11 J
pH meter would not calibrate.													
2/6/2002 10:30	2.2	1400	68	13.93	7.6	3	0.18	0.01 U	0.132		0.0036 J	0.6	2
3/6/2002 9:20	3.9	2190	70	13.23	7.92	4	0.154	0.01 U	0.092		0.0038	0.9	4 J
4/3/2002 9:25	6	2390	81	13.4	7.46	4	0.118	0.01 U	0.027		0.0032	2.3	5
5/8/2002 10:15	7.4 J	5090	50	12.9	7.44	3	0.108	0.01 U	0.052		0.003 U	1.2	2
Thermister reading varied between 6.9 and 8.0.													
6/4/2002 13:05	10	13100	32	11.7	8.06	16 J	0.099	0.01 U	0.053		0.003 U	3.5	12
7/10/2002 9:45	13	7110	29	11.1	7.34	6	0.084	0.01 U	0.042		0.003 U	2	12
8/7/2002 11:25	15.2	1700	48	10.5	8.25	3	0.158	0.01 U	0.111		0.0037	0.8	5
9/11/2002 10:15	17	798	77	10.3	8.05	2	0.284	0.01 U	0.213		0.0033	0.7	29

Conventional Data Report

Wenatchee R nr Leavenworth

45A110

Class: AA
Rivermile: 35.6
Latitude: 47 40 35.0
Longitude: 120 43 58.0
Waterbody: WA-45-1020

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/10/2001 8:10	7.8	217	46	10.9	7.66	1	0.048 J	0.01 UJ	0.012		0.003 U	0.8	1 UJ
11/14/2001 7:45	6.7	884	36	11.31	7.43	5	0.074	0.01 U	0.023		0.003	1.5	10 J
12/5/2001 7:45	3.2	928	35	12.2	6.79	2	0.083	0.01 U	0.051		0.003 U	0.5	2 J
1/9/2002 7:25	2.9	4600	28 J	12.46	7.28 J	9	0.141 J	0.01 UJ	0.065		0.003 U	2	5 J
pH meter would not calibrate.													
2/6/2002 9:10	1.5	813	37	13.13	7.14	1 U	0.09	0.01 U	0.05		0.003 UJ	0.5 U	3 J
3/6/2002 7:50	2.6	1310	37	12.82	8.39	1 U	0.1	0.01 U	0.051		0.003	0.6	1 UJ
4/3/2002 7:35	3.3	1300	45	12.6	6.98	2	0.091	0.01 U	0.021		0.0032	1.3	1 J
5/8/2002 8:40	4.9	3370	35	12.4	7.07	2	0.1	0.011	0.051		0.003 U	0.9	1
6/4/2002 8:50	7	8860	26	11.6	6.98	14	0.098	0.01 U	0.058		0.003 U	2.7	4 J
7/10/2002 7:35	10.2	5220	23	10.8	7.19	7	0.058	0.01 U	0.028		0.003 U	1.7	5 J
8/7/2002 8:35	11.7	1200	28	10.19	6.99	2	0.049	0.01 U	0.011		0.003 U	1.1	6 J
9/11/2002 7:25	14.3	493	36	9.3	6.88	1	0.025 U	0.01 U	0.014		0.003 U	0.6	4 J

Conventional Data Report

Chumstick Cr nr Leavenworth

45C070

Class: A
Rivermile: 0.2
Latitude: 47 36 26.0
Longitude: 120 38 46.0
Waterbody:

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
6/4/2002	11:15	11.6		273	10.1	6.94	6	0.294	0.01 U	0.226		0.024	2.4	68 J
7/8/2002	16:35	14.1		288	9.19	7.81	2	0.587	0.011	0.462		0.026	1.1	63
		No staff guage reading.												
8/7/2002	9:25	10.3		267	9	7.37	2	1.06	0.01 U	0.979		0.029	0.5	20 J
9/11/2002	8:30	10.8		299	8.6	7.26	1	1.1	0.01 U	1.03		0.025	0.7	1 UJ
		Surface film was visible in some areas.												

Conventional Data Report

Mission Cr nr Cashmere

45E070

Class: A
Rivermile: 0.2
Latitude: 47 31 17.0
Longitude: 120 28 29.0
Waterbody: WA-45-1011

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
6/4/2002 11:55	11.3		167	10.8	8.1	39	0.133	0.01 U	0.092		0.008	6.8 J	21
7/8/2002 17:05	17.8		207	9.4	8.4	8	0.293	0.01 U	0.198		0.0072	2.8	740 J
Water was very shallow at bridge site. Sampled by wading 100 ft. u/s from bridge.													
8/7/2002 10:35	13.3		204	10.6	8.29	4	0.61	0.01 U	0.536		0.0084	1.7	200
Creek was too shallow to sample from bridge. Sample was taken approximately 100 feet up-stream of site with sampler sitting on the bottom of the stream bed.													
9/11/2002 9:15	14.1		152	10	8.02	2	0.457	0.01 U	0.396		0.0069	1.2	250
No tape down -- water too shallow. Sample bottles filled by hand diping except DO. DO sampler on bottom.													

Conventional Data Report

Entiat R nr Entiat

46A070

Class: A
Rivermile: 1.5
Latitude: 47 39 48.0
Longitude: 120 14 58.0
Waterbody: WA-46-1010

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/9/2001 17:00	11	77	137	11.41	8.43	2 J	0.218 J	0.01 UJ	0.167 J		0.0041 J	0.6 J	11
Staff out of water													
11/13/2001 16:05	6.5	100	115	11.91	7.41	2	0.173	0.01 U	0.111		0.0061	0.7	1 U
Stage is from GW. Staff Gage was out of water.													
12/4/2001 16:45	1.1	133	94	13	7.75	1	0.145	0.01 U	0.11		0.0048	0.5 U	2
1/8/2002 16:15	2.2	342	64 J	12.96	7.61	16	0.108 J	0.01 UJ	0.042		0.0041	3.5	35
2/5/2002 16:20		136	96	13.63	8.05	9	0.137	0.01 U	0.087		0.0039	0.5 U	1 U
Temperature was not recorded.													
3/5/2002 15:43	6.4	188	95	12.62	8.4	2	0.138	0.01	0.08		0.0055	0.7	1
4/2/2002 16:35	8.9	251		12	8.34	6	0.118	0.01 U	0.04		0.0048	1.7 J	3 J
Conductivity not available.													
5/7/2002 14:35	6.9	845	58	12.3	8.04	5	0.063	0.01 U	0.015		0.0031	1.3 J	1 U
6/11/2002 14:35	10.6	1530	36	11.3	7.56	17	0.057	0.01 U	0.019		0.003 U	2.5	1
7/9/2002 16:30	13	1040	34	10.8	8.04	9	0.05	0.01 U	0.013		0.003 U	1.8	3
8/6/2002 16:15	14.4	273	63	10.3	8.15	2	0.089	0.01 U	0.048		0.0047	0.5	4
9/10/2002 15:35	17.7	126	78	10.8	8.24	1	0.146	0.01 U	0.098		0.0042	0.6	9

Metals Data Report

Entiat R nr Entiat

46A070

Class: A
Rivermile: 1.5
Latitude: 47 39 48.0
Longitude: 120 14 58.0
Waterbody: WA-46-1010

Date/Time		Flow CFS	Hardness mg/L	Tot. Rec. Cadmium ug/L	Dissolved Cadmium ug/L	Tot. Rec. Chromium ug/L	Dissolved Chromium ug/L	Tot. Rec. Copper ug/L	Dissolved Copper ug/L	Tot. Rec. Lead ug/L	Dissolved Lead ug/L	Total Mercury ug/L	Dissolved Nickle ug/L	Tot. Rec. Arsenic ug/L	Tot. Rec. Zinc ug/L	Dissolved Zinc ug/L
10/9/2001	17:00		54.1	0.1 U	0.02 U	0.5 U	0.21	0.31	0.27	0.1 U	0.029	0.002 U	0.31	0.35	1.4	1.9
12/4/2001	16:45		40.4	0.1 U	0.02 U	0.5 U	0.26	0.5 J	0.14	0.1 U	0.02 U	0.002 U	0.1 U	0.2 U	1.4 J	3.5
2/5/2002	16:20		43.7	0.1 U	0.02 U	0.5 U	0.27	0.45 J	0.18	0.1 U	0.02 U	0.004 U	0.2	0.23	1.2	0.73
4/2/2002	16:35		50.1	0.1 U	0.1 U	0.5 U	0.5 U	0.41	0.18	0.1 U	0.1 U	0.002 U	0.32	0.45	2	1.5
6/11/2002	14:35		16	0.1 U	0.02 U	0.5 U	0.25 U	0.42	0.12	0.22	0.02 U	0.002 U	0.2	0.1 U	5 U	0.64
8/6/2002	16:15		28.8	0.1 U	0.02	0.5 U	0.25 U	0.35	0.28	0.1 U	0.02 U	0.002 U	0.15	0.17	5 U	1.7

Conventional Data Report

Methow R nr Pateros

48A070

Class: A
Rivermile: 5
Latitude: 48 04 29.0
Longitude: 119 57 20.0
Waterbody: WA-48-1010

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/9/2001	15:01	9.5	297	216	12.82	8.22	2 J	0.292 J	0.01 UJ	0.229 J		0.003 UJ	0.7 J	3
11/13/2001	14:27	6.4	290	194	12.42	8.53	1	0.305	0.01 U	0.248		0.0042	0.7	3
12/4/2001	14:50	2.3	267	184	13.8	8.08	1	0.262	0.01 U	0.234		0.0039	0.5	1 U
1/8/2002	14:40	4	309	179 J	13.26	8.46 J	3	0.282 J	0.01 UJ	0.207		0.0034	0.6	1 U
		A lot of meter drift. Meter very slow.												
2/5/2002	14:52	3	297	177	13.63	8.31	2	0.24	0.01 U	0.192		0.0061	0.5	1 U
3/5/2002	14:27	5.7	378	169	13.03 J	8.29	3	0.196	0.01 U	0.142		0.003 U	1	1 U
		Lab error during DO analysis. Amount shown is within .5 of actual value.												
4/2/2002	14:55	9.9	592	159	11.4	8.33	14	0.214	0.01 U	0.113		0.003 U	3.8 J	1 U
		Barometric pressure was averaged between Omak apt. and Wenatchee apt.												
5/7/2002	13:10	7.6	2400	105	12.5	8.06	4	0.101	0.01 U	0.031		0.003 U	2.1 J	1
6/11/2002	12:55	11	5250	68	11.2	7.46	19	0.084	0.01 U	0.032		0.003 U	5	11
7/9/2002	14:35	13.4	3360	68	10.6	8.01	8	0.074	0.01 U	0.028		0.003 U	2.5	18
8/6/2002	14:53	15.6	685	136	9.9	8.19	1	0.17	0.01 U	0.123		0.0041	0.5 U	1 U
9/10/2002	14:05	16.9	347	155	9.8	8.23	1 U	0.262	0.01 U	0.212		0.0033	0.5 U	1 U
		Bridige work was in progress in several locations up-stream of the site.												

Conventional Data Report

Methow R @ Twisp

48A140

Class: A
Rivermile: 39.4
Latitude: 48 21 34.0
Longitude: 120 06 47.0
Waterbody: WA-48-1020

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/9/2001	13:30	9.3	224	161	11.71	8.26	1 UJ	0.235 J	0.01 UJ	0.185 J		0.003 UJ	0.5 UJ	2
		Staff reading taken at 12:15												
11/13/2001	13:05	6.8	215	155	12.02	8	1 U	0.214	0.01 U	0.167		0.0046	0.5 U	1 U
		Heavy bridge construction going on just upstream of site.												
12/4/2001	13:40	2.7	259	152	13.1	7.96	1 U	0.182	0.01 U	0.156		0.0036	0.5 U	1 U
1/8/2002	13:15	4.8	242	146 J	12.66	7.89	2	0.185 J	0.01 UJ	0.147		0.003 U	1	2
2/5/2002	12:58	3	228	150	13.23	8.13	2	0.176	0.01 U	0.138		0.003 U	0.7	1 U
3/5/2002	13:15	4.5	322	139	13.23	8.22	2	0.142	0.01 U	0.097		0.0032	0.5	1
4/2/2002	13:10	7.7	599	133	12.3	8.27	5	0.165	0.01 U	0.101		0.003 U	1.1 J	1
		Barometric pressure was averaged between Omak apt. and Wenatchee apt.												
5/7/2002	11:33	5.5	2240	99	12.8	8.04	2	0.099	0.01 U	0.04		0.003 U	1.1	1 U
		New bridge span being installed approximately 40 feet upstream of the sampling site. (Heavy construction)												
6/11/2002	11:25	8.4	5210	61	11.4	7.92	14	0.078	0.01 U	0.026		0.003 U	3.8	6
7/9/2002	12:57	10.9	3190	63	11.3	8.15	5	0.065	0.01 U	0.025		0.003 U	1.5	10
		Bridge construction underway 50 ft. u/s from sampling site.												
8/6/2002	12:50	12.9	610	117	10.4	8.13	1	0.16	0.01 U	0.123		0.004	0.5 U	3
9/10/2002	12:40	14.1	284	129	10.1	8.22	1 U	0.222	0.01 U	0.193		0.003 U	0.5 U	5
		Sample was taken from the up-stream side of bridge from the new span recently completed. A worker was wading mid-stream approximately 50 meters u/s when FC sample was taken.												

Metals Data Report

Methow R @ Twisp

48A140

Class: A
Rivermile: 39.4
Latitude: 48 21 34.0
Longitude: 120 06 47.0
Waterbody: WA-48-1020

Date/Time		Flow CFS	Hardness mg/L	Tot. Rec. Cadmium ug/L	Dissolved Cadmium ug/L	Tot. Rec. Chromium ug/L	Dissolved Chromium ug/L	Tot. Rec. Copper ug/L	Dissolved Copper ug/L	Tot. Rec. Lead ug/L	Dissolved Lead ug/L	Total Mercury ug/L	Dissolved Nickle ug/L	Tot. Rec. Arsenic ug/L	Tot. Rec. Zinc ug/L	Dissolved Zinc ug/L
10/9/2001	13:30		76.1	0.1 U	0.02 U	0.5 U	0.16	0.26	0.15	0.1 U	0.02 U	0.002 U	0.38	0.42	1 U	0.31
12/4/2001	13:40		69.2	0.1 U	0.02 U	0.5 U	0.29	0.43 J	0.13	0.1 U	0.02 U	0.0033	0.1 U	0.35	1.2 J	0.4 U
2/5/2002	12:58		70.4	0.1 U	0.02 U	0.5 U	0.39	0.48 J	0.16	0.1 U	0.032	0.004 U	0.24	0.34	2.1	2.7
4/2/2002	13:10		65.8	0.1 U	0.1 U	0.5 U	0.5 U	0.34	0.18	0.1 U	0.1 U	0.002 U	0.39	0.42	2.7	1.2
6/11/2002	11:25		30.2	0.1 U	0.02 U	0.5 U	0.25 U	1.12	0.24	0.14	0.02 U	0.002 U	0.28	0.48	5 U	0.82
8/6/2002	12:50		58.9	0.1 U	0.02 U	0.5 U	0.25 U	0.32	0.24	0.1 U	0.02 U	0.002 U	0.28	0.47	5 U	0.73

Conventional Data Report

Okanogan R @ Malott

49A070

Class: A
Rivermile: 17
Latitude: 48 16 50.0
Longitude: 119 42 12.0
Waterbody: WA-49-1010

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/9/2001	11:00	10.6	758	331	10.6	8.39	2 J	0.176 J	0.01 UJ	0.017 J		0.0033 J	1 J	18
11/13/2001	11:18	5.6	872	313	12.02	7.93	2	0.177	0.01 U	0.032		0.0048	1.2	3
12/4/2001	11:45	2.9	876	290	12.2	8.31	2	0.183	0.01 U	0.078		0.0061 J	1.1	2
1/8/2002	11:45	3.1	793	303 J	12.66	7.86	3	0.192 J	0.01 UJ	0.076		0.0053	1	5
2/5/2002	11:34	1.4	936	279	13.63	8.2	3	0.182	0.01 U	0.069		0.0044	1.5	1
3/5/2002	11:55	4.1	1250	251	13.23	7.93	9	0.156	0.01 U	0.02		0.0033	3.1	1
		pH meter recalibrated after initial reading and sample remeasured.												
4/2/2002	11:47	8.2	1060	286	11.3	8.14	5	0.164	0.01 U	0.011		0.0037	2.2 J	1 U
5/7/2002	10:20	9.1	6050	166	11.2	8.23	38	0.18	0.01 U	0.01 U		0.003 U	16	12
		River mildly turbid.												
6/11/2002	10:10	12.7	12500	137	10.5	8.02	69	0.147	0.012	0.017		0.0045	19	11
7/9/2002	11:15	17.6	4920	128	9.3	7.83	33	0.118	0.014	0.017		0.0062	14	44
		River turbid. Oil sheen observed on the surface.												
8/6/2002	11:45	19.3	1460	220	8.8	8.2	6	0.119	0.01 U	0.01 U		0.0045	2	16
9/10/2002	11:30	18.2	1160	250	9.1	8.34	6	0.156	0.01 U	0.01 U		0.0035	2.6	25

Conventional Data Report

Okanogan R @ Oroville

49A190

Class: A
Rivermile: 78
Latitude: 48 56 21.0
Longitude: 119 25 32.0
Waterbody: WA-49-1040

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/9/2001	9:27	14.6	458	309	10	8.46	4 J	0.212 J	0.01 UJ	0.01 UJ		0.003 UJ	1.7 J	1 J
11/13/2001	9:40	8.8	402	316	10.1	7.87	6	0.257	0.01 U	0.039		0.0038	2	2 J
12/4/2001	10:15	5.9	424	320	10.9	8.11	3	0.227	0.01 U	0.044		0.0041 J	1.5	1 J
1/8/2002	10:12	2.8	311	308 J	12.96	8.01	3	0.209 J	0.01 UJ	0.021		0.003 U	1	1 UJ
2/5/2002	10:02	1.5	311	324	14.14	8.06	2	0.187	0.01 U	0.01 U		0.003 U	1.1	1 UJ
		OAT 4.3 degree C												
3/5/2002	10:20	2.5	538	311	13.53	8.14	18	0.218	0.01 U	0.01 U		0.003 U	5.7	1 J
		pH meter recalibrated after initial reading and sample remeasured.												
4/2/2002	10:05	3.7	386	311	13.3	8.3 J	10	0.202	0.01 U	0.01 U		0.003 U	1.7	1 UJ
		Very long response time for pH reading. "J" result.												
5/7/2002	8:49	11.2	1260	308	10.8	8.33	10	0.195	0.01 U	0.01 U		0.003 U	4.6	2 J
6/11/2002	8:42	14.8	3000 J	280	8.4	7.9	6	0.186	0.01 U	0.01 U		0.003 U	2.1	1 U
7/9/2002	9:10	20.6	615	254	8.5	8.21	16	0.177	0.015	0.01 U		0.003 U	6.3	17
8/6/2002	9:57	20	369	261	8.19	8.38	8	0.212	0.011	0.01 U		0.0036	3	20
9/10/2002	10:10	19.1	737	248	7.9	8.25	7	0.192	0.01 U	0.01 U		0.003 U	3.1	6

Conventional Data Report

Similkameen R @ Oroville

49B070

Class: A
Rivermile: 5
Latitude: 48 56 05.0
Longitude: 119 26 27.0
Waterbody: WA-49-1030

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/9/2001	8:50	9.5	220	228	11.11	8.21	2 J	0.076 J	0.01 UJ	0.01 UJ		0.003 UJ	0.7 J	1 J
11/13/2001	9:02	4.4	332	213	12.92	7.81	1	0.066	0.012	0.015		0.0045	0.5 U	1 UJ
12/4/2001	9:45	3	522	204	13.2	7.93	1	0.081	0.01 U	0.042		0.0037 J	0.6	1 J
1/8/2002	9:35	3.8	955	209 J	13.16	8.1	2	0.074 J	0.01 UJ	0.026		0.0035	0.7	1 UJ
2/5/2002	9:25	1	603	185	14.44	8.06	1	0.07	0.01 U	0.01 U		0.003 U	0.8	1 J
		Barometric pressure at Omak airport was not recorded until approx. 3 hours after sampling.												
3/5/2002	9:50	3.9	729	177	13.33	8.13	2	0.085	0.01 U	0.01 U		0.003 U	1	1 UJ
4/2/2002	9:45	7.6	628	200	12.4	7.76	2	0.069	0.01 U	0.01 U		0.003 U	1.4	1 UJ
		wwg 10.51												
5/7/2002	8:25	6.8	4590	124	12.9	7.38	17	0.143	0.01 U	0.01 U		0.003 U	7.3	11 J
		River appears mildly turbid.												
6/11/2002	8:18	10.9	10700	90	12	7.22	59	0.124	0.011	0.014		0.0036	17	8
7/9/2002	8:40	13.5	6460 J	76	11.2	7.61	88	0.077	0.01 U	0.01 U		0.003 U	21	290
		River turbid. Heavy rain reported during previous night.												
8/6/2002	8:47	15.7	1100 J	162	9.9	7.55	2	0.064	0.01 U	0.01 U		0.0041	1.3	6 J
9/10/2002	9:35	16.4	427 J	178	9.5	8.05	1 U	0.052	0.01 U	0.01 U		0.0033	0.6	5

Conventional Data Report

Columbia R @ Grand Coulee

53A070

Class: A
Rivermile: 596
Latitude: 47 57 56.0
Longitude: 118 58 51.0
Waterbody: WA-CR-1050

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/14/2001 11:50	17.8	41400 J	134	7.93	8.04	1 U	0.109 J	0.01 UJ	0.059		0.003 U	0.5	2
11/4/2001 12:15	15.1	43600 J	134	8.8	7.87	1 U	0.112 J	0.01 UJ	0.074 J		0.0054	0.6	1
12/2/2001 11:35	11.1	55300 J	133	9.69	7.96	1	0.138	0.01 U	0.089		0.0042	0.8	1 U
1/13/2002 11:40	6.1	52400 J	124	10.94	8.3	1 U	0.202	0.01 U	0.152		0.0043	0.7	1 U
3/11/2002 16:45	3	51300 J	145	12.75	7.96	1 U	0.269	0.01 U	0.21		0.0037	1.7	1 U
4/8/2002 16:30	4.1	28200 J	144	13.36	7.72	1	0.271	0.01 U	0.204		0.003 U	0.8	1 U
5/12/2002 15:50	9.1	91600 J	133	11.6	7.87	1 U	0.198	0.01 U	0.085		0.003	1.3	1 U
6/3/2002 16:40	10.9	170600 J	115	11.23	7.8	1	0.159	0.024	0.072		0.003 U	1.2	1 U
7/15/2002 16:10	15.8	187300 J	131	10.4	8.05	1 U	0.146	0.027	0.031		0.0037	0.7	1 U
8/12/2002 16:00	18	122000 J	121	9.38	8.16	1	0.128	0.01 U	0.052		0.0036	0.5 U	1
9/9/2002 16:00	18.6	84500 J	106	8.42	8.08	1 U	0.094	0.01 U	0.057		0.0034	0.5 U	

Conventional Data Report

Spokane R @ Riverside State Pk

54A120

Class: A
Rivermile: 66
Latitude: 47 41 48.0
Longitude: 117 29 48.0
Waterbody: WA-54-1020

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/14/2001	14:45	12.1	1900	168	10.65	8.23	1	1.02 J	0.01 UJ	0.948		0.0042	0.8	9
		Met with KREM2 TV to discuss As and Cr sampling on the Spokane River. Sampled here before Little Spokane												
11/4/2001	16:00	10.6	2500	147	11.3	7.52	1	0.869 J	0.01 UJ	0.846 J		0.0703	0.8	6
12/2/2001	15:10	6.7	3480	118	12	7.69	3	0.694	0.01 U	0.602		0.0474	1.1	11
1/13/2002	15:35	5.2	6120	90	12.63	8	4	0.899	0.013	0.827		0.0407	3.3	7
2/12/2002	10:15	3.6	5080	61.1 J	13	8.2	3	1.26	0.012	1.15		0.043	3.4	1 J
3/12/2002	8:50	3.6	6400	111	12.65	7.51	490		0.051	3.3		0.0632	240	92 J
		bank sample due to high, turbulant flow												
4/9/2002	9:25	4.7	12300	74	13.97	7.8	7 J	0.422	0.011	0.3		0.016	2.8	5
		sampled from bank												
5/13/2002	9:10	9.6	16300	62	12.09	7.66	5	0.286	0.01 U	0.173		0.0042	4.8	6
6/4/2002	9:10	12.8	29100	46	12.14	8.08	6	0.158	0.013	0.086		0.003 U	3.5	5 J
7/16/2002	8:55	17.6	3100	129	9.09	8.1	2	0.842	0.01 U	0.743		0.0096	0.8	21
8/13/2002	8:35	15.2	1390	203	9.08	8.2	1	1.31	0.043	1.16		0.011	0.5	24
9/10/2002	8:50	13	1590	200	10.05	8.08	2	1.35	0.01 U	1.27		0.011	0.8	72 J

Metals Data Report

Spokane R @ Riverside State Pk

54A120

Class: A
Rivermile: 66
Latitude: 47 41 48.0
Longitude: 117 29 48.0
Waterbody: WA-54-1020

Date/Time		Flow CFS	Hardness mg/L	Tot. Rec. Cadmium ug/L	Dissolved Cadmium ug/L	Tot. Rec. Chromium ug/L	Dissolved Chromium ug/L	Tot. Rec. Copper ug/L	Dissolved Copper ug/L	Tot. Rec. Lead ug/L	Dissolved Lead ug/L	Total Mercury ug/L	Dissolved Nickle ug/L	Tot. Rec. Arsenic ug/L	Tot. Rec. Zinc ug/L	Dissolved Zinc ug/L
11/4/2001	16:00		65.9													
1/13/2002	15:35		40.7													
3/12/2002	8:50		53.6													
5/13/2002	9:10		28.8													

Conventional Data Report

Little Spokane R nr Mouth

55B070

Class: A
Rivermile: 1.1
Latitude: 47 46 59.0
Longitude: 117 31 46.0
Waterbody: WA-55-1010

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/14/2001	15:30	10.8	389	294	10.25	8.13	2	1.46 J	0.01 UJ	1.34		0.0072	1	14
		Metals Station												
11/4/2001	15:10	9.5	420	287	10.19	8.14	2	1.31 J	0.01 UJ	1.31 J		0.011	0.9	13
12/2/2001	14:20	6.2	553	253	10.6	7.86	5	1.35	0.011	1.24		0.018	2.4	44
1/13/2002	14:50	4.5	909	187	10.94	7.97	17	1.16	0.023	1		0.0306	9.8	31
2/12/2002	9:05	4.1	626	132 J	12.6	7.91	7	1.3	0.012	1.18		0.021	3.5	14 J
3/12/2002	8:00	5.8	945	205	10.3	7.85	25	1.17	0.021	1.01		0.025	17	32 J
4/9/2002	8:40	8.2	1070	176	9.69	7.55	16 J	0.827	0.018	0.615		0.019	8.4	29
5/13/2002	8:30	11.8	709	195	8.48	7.89	11	0.975	0.01 U	0.833		0.015	4	36
6/4/2002	8:25	13.9	588	212	8.4	7.81	10	1	0.014	0.956		0.014	2.8	56 J
7/16/2002	7:55	14.4	409	245	7.97	7.49 J	4	1.27	0.014	1.14		0.011	1.4	83 J
		small wildfire in area, basecamp across stream from sampling station												
8/13/2002	7:55	12.7	378	279	8.36	8.12	4	1.36	0.011	1.25		0.0096	1.1	160 J
9/10/2002	8:05	11	376	248	8.93	7.91	4	1.34	0.01 U	1.28		0.0087	1.1	66 J

Metals Data Report

Little Spokane R nr Mouth

55B070

Class: A
Rivermile: 1.1
Latitude: 47 46 59.0
Longitude: 117 31 46.0
Waterbody: WA-55-1010

Date/Time		Flow CFS	Hardness mg/L	Tot. Rec. Cadmium ug/L	Dissolved Cadmium ug/L	Tot. Rec. Chromium ug/L	Dissolved Chromium ug/L	Tot. Rec. Copper ug/L	Dissolved Copper ug/L	Tot. Rec. Lead ug/L	Dissolved Lead ug/L	Total Mercury ug/L	Dissolved Nickle ug/L	Tot. Rec. Arsenic ug/L	Tot. Rec. Zinc ug/L	Dissolved Zinc ug/L
10/14/2001	15:30		144		0.02 U		0.38		0.22		0.02 U	0.002 U	0.6			0.75
12/2/2001	14:20		127	0.1 U	0.02 U	0.5 U	0.69	0.63 J	0.21	0.16	0.02 U	0.0022	0.17	2.68	2.2 J	0.46
2/12/2002	9:05		114	0.1 U	0.02 U	0.56	0.66	0.75 J	0.35	0.23	0.031	0.004 U	0.39	2.37	1.7	0.44
4/9/2002	8:40		86.2	0.1 U	0.02 U	0.73	0.64	1.23	0.6	0.55	0.11	0.0052	0.6	2.12	2.4	0.98
6/4/2002	8:25		113	0.1 U	0.02 U	0.5 U	0.54	0.58	0.32	0.48	0.06	0.002 U	0.9	2.74	9.7	0.89
8/13/2002	7:55		138.5	0.1 U	0.02 U	0.62	0.82	0.44	0.26	0.1 U	0.02 U	0.002 U	0.52	3.16	5 U	3.6

Conventional Data Report

Hangman Cr @ Mouth

56A070

Class: A
Rivermile: 0.6
Latitude: 47 39 17.0
Longitude: 117 27 12.0
Waterbody: WA-56-1010

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/14/2001 13:50	11.3	10	404	13.36	8.32	2	1.02 J	0.01 UJ	0.82		0.008	0.9	9
11/4/2001 14:25	8.8	15	368	13.6	8.48	1	0.707 J	0.01 UJ	0.569 J		0.012	0.9	33
12/2/2001 13:40	2.7	60	286	13.4	8.14	2	0.94	0.01 U	0.729		0.018	1.8	6
1/13/2002 13:55	3.2	314	173	12.23	7.97	14	7.25	0.043	7.11		0.0908	27	64 J
2/12/2002 11:00	0.9	303	102 J	13.4	7.85	13	8.9	0.019	8.45		0.0855	26	13
3/12/2002 9:35	2.7	4280	134	12.55	7.46	1110		0.099	7.2		0.107	600	130 J
4/9/2002 10:07	8.5	425	105	11.02	7.71	10 J	1.71	0.026	1.45		0.0318	21	11 J
5/13/2002 10:00	13.7	99	197	10.14 J	8.62	3	0.968	0.01 U	0.684		0.0076	4	11
6/4/2002 9:45	17.6	65	235	9.91	8.25	5	0.7	0.016	0.406		0.01	3	40 J
7/16/2002 9:40	18.7	14	335	8.98	7.95	5	0.994	0.02	0.706		0.016	1.9	110
8/13/2002 9:15	16.1	7.5	367	8.16	8.13	3	1.13	0.023	0.864		0.012	1.8	65
9/10/2002 9:50	12.9	11	347	9.74	8.35	2	1.15	0.01 U	0.944		0.01	1	67

Conventional Data Report

Spokane R @ Stateline Br

57A150

Class: A
Rivermile: 96.35
Latitude: 47 41 55.0
Longitude: 117 02 37.0
Waterbody: WA-57-1010

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/15/2001	16:10	13.1	1450 J	58	9.94	8.09	1 U	0.153 J	0.01 UJ	0.078		0.003 U	0.7	3
		Metals Station												
11/5/2001	15:05	10.5	2070 J	59	10.5	7.93	1 U	0.138 J	0.01 UJ	0.07 J		0.0042	0.6	4
12/3/2001	15:30	6.4		56	10.8	7.3	1 U	0.153	0.016	0.069		0.006	0.7	5
1/14/2002	15:45	4.5	7240 J	54	11.64	7.86	2	0.152	0.014	0.075		0.0043	1.3	1
2/12/2002	7:30	2.8	4580 J	31.5 J	13.8	7.24	2	0.16	0.012	0.072		0.0046	1.1	4 J
3/12/2002	6:45	3	6050 J	57	12.44	7.54	2	0.195	0.018	0.086		0.0036	1.8	4 J
4/9/2002	7:10	3.7	12500 J	58	13.16	8.01	2 J	0.192	0.01 U	0.096		0.003 U	1.3	1
5/13/2002	7:10	8.7	15800 J	44	11.51	7.66	3	0.135	0.01 U	0.033		0.0041	4	4 J
6/4/2002	7:00		28400 J	38	11.53	8.15	4	0.071	0.01 U	0.01 U		0.003 U	2.8	4 J
		didn't record temperature												
7/16/2002	6:55	22.5	2270 J	37	8.18	7.39 J	2	0.115	0.012	0.021		0.0038	1.1	16 J
		pH potentially low												
8/13/2002	6:35	20.3	721 J	44	7.85	7.47	1	0.184	0.014	0.084		0.0048	0.6	34 J
9/10/2002	6:50	18.2	1210 J	40	8.12	7.7	2	0.135	0.01 U	0.073		0.0034	0.7	22 J

Metals Data Report

Spokane R @ Stateline Br

57A150

Class: A
Rivermile: 96.35
Latitude: 47 41 55.0
Longitude: 117 02 37.0
Waterbody: WA-57-1010

Date/Time		Flow CFS	Hardness mg/L	Tot. Rec. Cadmium ug/L	Dissolved Cadmium ug/L	Tot. Rec. Chromium ug/L	Dissolved Chromium ug/L	Tot. Rec. Copper ug/L	Dissolved Copper ug/L	Tot. Rec. Lead ug/L	Dissolved Lead ug/L	Total Mercury ug/L	Dissolved Nickle ug/L	Tot. Rec. Arsenic ug/L	Tot. Rec. Zinc ug/L	Dissolved Zinc ug/L
10/15/2001	16:10		23.6	0.13	0.08	0.5 U	0.1	0.63	0.504	1.16	0.223	0.002 U	0.27	0.55	37.6	31.5
12/3/2001	15:30		23.4	0.18	0.15	0.5 U	0.25 U	0.84 J	0.45	0.98	0.068	0.002 U	0.1 U	0.5	61.2	55.1
2/12/2002	7:30		24.6	0.19	0.16	0.5 U	0.2 U	0.86 J	0.591	1.33	0.254	0.004 U	0.39	0.5	68.7	61.3
4/9/2002	7:10		24.7	0.27	0.228	0.5 U	0.5 U	0.92	0.591	2.78	0.549	0.0021	0.39	0.51	69	71.8
6/4/2002	7:00		17.8	0.32	0.23	0.5 U	0.25 U	0.76	0.517	10.1	1.77	0.0032	0.3	0.45	54.5	49.1
8/13/2002	6:35		18.4	0.13	0.12	0.5 U	0.25 U	0.79	0.45	1.2	0.19	0.002 U	0.17	0.47	38	34.6

Conventional Data Report

Kettle R nr Barstow

60A070

Class: AA
Rivermile: 10.9
Latitude: 48 47 05.0
Longitude: 118 07 27.0
Waterbody: WA-60-1010

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/15/2001	12:35	8	244 J	223	11.85	8.15	1 U	0.157 J	0.01 UJ	0.091		0.003 U	0.5 U	1
		Metals Station												
11/5/2001	12:15	7.5	353 J	194	11.9	8.22	1 U	0.086 J	0.01 UJ	0.038 J		0.0037	0.5 U	1
12/3/2001	12:20	2	710 J	131	13.4	7.88	1 U	0.156	0.01 U	0.096		0.0038	0.5 U	1 U
1/14/2002	12:35	0.8	1060 J	104	13.93	8.16	2	0.136	0.01 U	0.065		0.0034	0.8	1
2/11/2002	14:35	1.1	711 J	76.8 J	16.1	8.29	1	0.162	0.01 U	0.085		0.003 U	0.8	1 UJ
3/11/2002	13:25	2.4	650 J	167	13.67	8.22	2	0.16	0.01 U	0.07		0.0041	0.7	1 U
4/8/2002	13:37	7.5	2380 J	101	12.04	7.81	17	0.136	0.01 U	0.01 U		0.003 U	4.5 J	4
5/12/2002	12:45	9.9	5250 J	81	11.31	7.69	3	0.136	0.01 U	0.01 U		0.0037	1.4	2
6/3/2002	13:30	10.1	14900 J	37	12.14	8.19	42	0.128	0.012	0.01		0.0033	9	13
7/15/2002	13:00	21.3	2070 J	85	8.78	8.11	3	0.127	0.01 U	0.024		0.0041	0.9	13
8/12/2002	12:20	20.2	441 J	162	9.28	8.52	1 U	0.122	0.01	0.021		0.0034	0.5 UJ	3
9/9/2002	13:00	15.9	223 J	189	10.05	8.64	1	0.121	0.01 U	0.025		0.0039	0.5 U	1

Metals Data Report

Kettle R nr Barstow

60A070

Class: AA
Rivermile: 10.9
Latitude: 48 47 05.0
Longitude: 118 07 27.0
Waterbody: WA-60-1010

Date/Time		Flow CFS	Hardness mg/L	Tot. Rec. Cadmium ug/L	Dissolved Cadmium ug/L	Tot. Rec. Chromium ug/L	Dissolved Chromium ug/L	Tot. Rec. Copper ug/L	Dissolved Copper ug/L	Tot. Rec. Lead ug/L	Dissolved Lead ug/L	Total Mercury ug/L	Dissolved Nickle ug/L	Tot. Rec. Arsenic ug/L	Tot. Rec. Zinc ug/L	Dissolved Zinc ug/L
10/15/2001	12:35		103	0.1 U	0.02 U	0.5 U	0.26	0.54	0.45	0.1 U	0.02 U	0.002 U	0.56	0.94	1.1	1
12/3/2001	12:20		62.6	0.1 U	0.02 U	0.58	0.32	0.87 J	0.3	0.7	0.02 U	0.0025	0.1 U	0.98	2.3 J	0.4 U
2/11/2002	14:35		62.5	0.1 U	0.02 U	0.5 U	0.29	0.57 J	0.33	0.1 U	0.02 U	0.004 U	0.29	0.41	1.4	0.59
4/8/2002	13:37		51.4	0.1 U	0.02 U	0.55	0.67	1.21	0.556	0.26	0.02 U	0.0023	0.41	0.44	1.6	0.5 U
6/3/2002	13:30		19.9	0.1 U	0.02 U	1.3	0.25 U	1.8	0.594	0.58	0.02 U	0.0033	0.36	0.27	5.3	0.67
8/12/2002	12:20		76.3	0.1 U	0.11	0.53	0.42	0.66	0.78	0.1 U	0.04	0.002 U	0.54	0.61	5 U	5.07

Conventional Data Report

Columbia R @ Northport

61A070

Class: AA
Rivermile: 735.1
Latitude: 48 55 21.0
Longitude: 117 46 32.0
Waterbody: WA-CR-1060

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/15/2001	11:15	12.2	73800	144	9.84	8.04	2	0.118 J	0.01 UJ	0.053		0.003 U	0.9	40
11/5/2001	10:50	9.4	63500	141	10.5	7.92	1	0.118 J	0.01 UJ	0.076 J		0.003 U	0.7	85 J
12/3/2001	11:00	6.7	94200	126	11.1	7.78	2	0.159	0.01 U	0.114		0.003 U	1	110
1/14/2002	11:20	3.6	80900	131	12.23	8.17	1	0.16	0.01 U	0.106		0.003 U	0.8	1 U
2/11/2002	12:50	3.2	63200	91.4 J	14.3	7.46	1	0.175	0.01 U	0.107		0.003 U	1.5	1 UJ
3/11/2002	12:00	2.7	63700		12.95	8.26	1	0.164	0.01 U	0.107		0.003 U	1.1	1 U
4/8/2002	12:17	5.6	39700	142	12.55	8.12	3	0.158	0.015	0.074		0.003 U	1.4	1 U
5/12/2002	11:15	7.9	84600	143	12.58	7.84	2	0.157	0.01 U	0.071		0.003 U	1.7	2
6/3/2002	11:50	11.1	195000	111	12.75	8.27	11	0.122	0.01 U	0.051		0.003 U	3.1	10
7/15/2002	11:10	16.3	186000	106	11.01	7.67	3	0.124	0.011	0.034		0.003 U	1.3	2 J
8/12/2002	10:50	17.7	166000	120	10	8.54	3	0.097	0.012	0.019		0.003 U	1.1	3
9/9/2002	11:35	17	88500	108	9.34	8.49	2	0.101	0.01 U	0.03		0.003 U	0.8	11

Conventional Data Report

Pend Oreille @ Metaline Falls

62A090

Class: A
Rivermile: 27
Latitude: 48 51 54.0
Longitude: 117 22 20.0
Waterbody: WA-62-1010

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/15/2001 8:40	11.9	17600	173	9.54	8.21	1	0.083 J	0.01 UJ	0.01 U		0.003 U	1.1	1 J
11/5/2001 8:25	9.1	17100	165	10.1	8.17	1	0.058 J	0.01 UJ	0.01 UJ		0.003 U	1	1 UJ
12/3/2001 8:40	3.9	9420	153	11.2	7.76	3	0.078	0.01 U	0.01 U		0.003 U	1.2	2 J
1/14/2002 8:55	2.8	20900	146	11.64	8.2	2	0.14	0.01 U	0.06		0.0031	2.3	1 J
2/11/2002 10:15	2.2	19400	96.1 J	14.8	8.31	2	0.097	0.01 U	0.011		0.003 U	1.5	1 UJ
3/11/2002 9:35	1.4	16100	158	13.16	8.11	3	0.161	0.01 U	0.021		0.0033	1.7	1 UJ
4/8/2002 9:11	6.6	15200	151	13.87 J	8.06	4	0.131	0.01 U	0.01 U		0.003 U	2.4	1 UJ
5/12/2002 8:45	9.1	31300	114	11.41	7.87	4	0.131	0.01 U	0.01 U		0.003 U	4.2	1 UJ
6/3/2002 8:35	12.4	78200	112	11.33	7.92	13	0.103	0.01 U	0.01 U		0.003 U	5.8	3 J
7/15/2002 8:50	20.2	33900	121	9.59	7.94	4	0.189	0.013	0.01 U		0.0034	2.4	1 J
8/12/2002 8:30	20.4	14000	143	8.97	8.68	2	0.102	0.01 U	0.01 U		0.003 U	1.3	3 J
9/9/2002 8:55	18.2	12000	131	8.83	8.7	2	0.087	0.01 U	0.01 U		0.013	1	1 U

Conventional Data Report

Pend Oreille R @ Newport

62A150

Class: A
Rivermile: 88.2
Latitude: 48 11 07.0
Longitude: 117 02 02.0
Waterbody: WA-62-1020

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/15/2001 7:00	12.3	19600 J	173	9.54	8.15	2	0.088 J	0.01 UJ	0.01 U		0.003 U	1.3	1 UJ
11/5/2001 7:00	8.9	18800 J	164	10.1	8.13	2	0.066 J	0.01 UJ	0.011 J		0.003 U	1.1	1 J
12/3/2001 6:55	4	9040 J	147	11.5	7.6	2	0.083	0.01 U	0.014		0.003 U	1.4	2 J
1/14/2002 7:25	3.2	19100 J	150	11.84	7.82	2	0.112	0.01 U	0.053		0.003 U	1.6	1 J
2/11/2002 7:55	2.6	18300 J	93.7 J	14.5	7.8	3	0.128	0.01 U	0.038		0.003 U	2.3	1 J
3/11/2002 7:45	0.5	16400 J	165	13.16	7.63	3	0.091	0.01 U	0.031		0.003 U	2.8	1 UJ
4/8/2002 7:27	5.8	14600 J	156	13.46 J	7.59	5	0.119	0.012	0.015		0.0037	3.5	1 J
5/12/2002 7:05	8.9	31000 J	130	11.21	7.68	4	0.124	0.01 U	0.01 U		0.003 U	7.5	1 UJ
6/3/2002 6:55	12	85800 J	121	11.03	7.76	9	0.099	0.011	0.01 U		0.003 U	4.9	5 J
7/15/2002 7:05	20.2	37100 J	125	15.65	7.85	3	0.132	0.017	0.01 U		0.0033	2.3	3 J
8/12/2002 6:45	19.9	16400 J	147	8.97	8.33	2	0.097	0.01 U	0.01 U		0.003 U	1.1	1 UJ
9/9/2002 7:00	19.1	12200 J	326	8.62	8.35	2	0.081	0.01 U	0.01 U		0.003 U	1.2	1 U

Appendix D

Water Year 2002: Missing Data (12 standard constituents only)

STATION	Date	Remarks	Temperature	Conductivity	Oxygen	ph	Suspended Solids	Total Persulf Nitrogen	ammonia-nitrogen	nitrate+nitrite-nitrogen	Phosphorus, total	Phosphorus, Sol Reactive	Turbidity	Fecal Coliform
01A050	2002/08/20	Shipment delayed. FC not run												X
01A120	2001/10/22	Bottle broke during shipment												X
01A120	2002/06/18	TP and TN Filtered and reported as Dissolved						X			X			
01A120	2002/08/20	Shipment delayed. FC not run												X
01A140	2002/01/21	TP Filtered and reported as Dissolved									X			
01A140	2002/08/20	Shipment delayed. FC not run												X
01D080	2002/08/20	Shipment delayed. FC not run												X
01F070	2002/01/21	TP Filtered and reported as Dissolved									X			
01F070	2002/06/18	TP and TN Filtered and reported as Dissolved						X			X			
01F070	2002/08/20	Shipment delayed. FC not run												X
01G070	2002/01/21	TP Filtered and reported as Dissolved									X			
01G070	2002/08/20	Shipment delayed. FC not run												X
01H070	2002/08/20	Shipment delayed. FC not run												X
03A060	2002/08/20	Shipment delayed. FC not run												X
03B050	2002/08/20	Shipment delayed. FC not run												X
05A070	2001/11/14	TP and TN Filtered and reported as Dissolved						X			X			
05A090	2001/11/14	TP and TN Filtered and reported as Dissolved						X			X			
05A110	2001/10/24	Oxygen not recorded			X									
05A110	2002/04/24	Temperature Not Recorded	X											
05B070	2001/11/14	TP and TN Filtered and reported as Dissolved						X			X			
05B110	2001/11/14	TP and TN Filtered and reported as Dissolved						X			X			
07D050	2002/01/23	No sample collected												X
07D130	2002/01/23	TP Filtered and reported as Dissolved									X			
08C070	2001/11/14	TP and TN Filtered and reported as Dissolved						X			X			

STATION	Date	Remarks	Temperature	Conductivity	Oxygen	ph	Suspended Solids	Total Persulf Nitrogen	ammonia-nitrogen	nitrate+nitrite-nitrogen	Phosphorus, total	Phosphorus, Sol Reactive	Turbidity	Fecal Coliform
08C070	2002/01/22	TP Filtered and reported as Dissolved									X			
09A080	2001/11/14	TP and TN Filtered and reported as Dissolved						X			X			
10A050	2002/07/30	TP and TN Filtered and reported as Dissolved						X			X			
10A070	2001/12/11	TP and TN Filtered and reported as Dissolved						X			X			
10A070	2002/07/30	TP and TN Filtered and reported as Dissolved						X			X			
10C095	2002/07/30	TP and TN Filtered and reported as Dissolved						X			X			
16C090	2002/01/29	No Access	X	X	X	X	X	X	X	X	X	X	X	X
24F070	2001/11/28	TP and TN Filtered and reported as Dissolved						X			X			
28G070	2001/11/28	TP and TN Filtered and reported as Dissolved						X			X			
28H070	2001/11/28	TP and TN Filtered and reported as Dissolved						X			X			
34A070	2002/03/13	TP Filtered and reported as Dissolved						X			X			
34A120	2002/03/12	TP Filtered and reported as Dissolved; stream too fast for thermister	X					X			X			
34A170	2002/03/12	TP Filtered and reported as Dissolved						X			X			
34B110	2002/03/12	TP Filtered and reported as Dissolved						X			X			
34H070	2002/03/12	TP Filtered and reported as Dissolved						X			X			
35F110	2001/12/05	No Access; road unplowed	X	X	X	X	X	X	X	X	X	X	X	X
37A090	2002/01/09	TP Filtered and reported as Dissolved						X			X			
46A070	2002/02/05	Temperature Not Recorded	X											
46A070	2002/04/02	Conductivity Not Recorded		X										
53A070	2002/02/__	Sample not collected	X	X	X	X	X	X	X	X	X	X	X	X
53A070	2002/09/09	Bottle broke during shipment												X
54A120	2002/03/12	TP Filtered and reported as Dissolved						X			X			
56A070	2002/03/12	TP Filtered and reported as Dissolved						X			X			
57A150	2002/06/04	Temperature Not Recorded	X											
61A070	2002/03/11	Conductivity Not Recorded		X										